

IN THE DISTRICT COURT OF THE  
UNITED STATES IN AND FOR THE  
SOUTHERN DISTRICT OF FLORIDA

MARY GREEN,

Plaintiff,

vs.

AMERICAN TOBACCO COMPANY,  
a corporation,

Defendant.

No. 8505-M-Civ-EC

EDWIN M. GREEN, JR., as  
Administrator of the Estate  
of EDWIN M. GREEN, Deceased,

Plaintiff,

vs.

AMERICAN TOBACCO COMPANY,  
a corporation,

Defendant.

No. 6070-M-Civ-EC

Federal Courthouse,  
Miami, Florida  
November 23, 1964,  
9:30 o'clock a.m.

The above-styled cases came on for further trial before the  
Honorable Emmet C. Choate, United States District Judge,  
pursuant to adjournment.

APPEARANCES:

As heretofore noted.

Thereupon--

The following proceedings were had:

THE COURT: Are you ready to proceed, Mr. Bradford?

Bring the jury in.

(Whereupon, the jury entered the courtroom, and the following proceeding were had:)

THE COURT: Call your first witness.

Thereupon--

VIRGIL HAGER,

was called as a witness by the defendant and, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

THE COURT: State your name, address, your occupation.

THE WITNESS: My name is Virgil Hager. I live in [DELETED] . I am a tobacco manufacturer.

THE COURT: How long have you been so engaged?

THE WITNESS: 34 years.

THE COURT: Are you engaged in the manufacturing of tobacco products?

THE WITNESS: Manufacturing of cigarettes and

smoking tobacco, cigars.

THE COURT: You may proceed.

BY MR. BRADFORD:

Q. Mr. Hager, first, tell us what school you went to. First tell us the high school, where you lived earlier in your life.

A. I went through high school in Louisville, Kentucky, my home. Then I went through Purdue University in Lafayette, Indiana.

Q. Did you graduate from Purdue?

A. Yes.

Q. After you were graduated from Purdue, what occupation did you pursue or where did you go from there?

A. I went to work with Colgate & Company in Jeffersonville, Indiana.

Q. And how long did you remain with them?

A. I worked with Colgate three years.

Q. And then where did you go?

A. Then I went to work for the American Tobacco Company in Louisville, Kentucky.

Q. How long were you in Louisville, Kentucky, in the employment of the American Tobacco Company?

A. Approximately one year.

Q. What type of work did you do there?

A. This is a cigarette manufacturing plant. I hired some of the new employees. And then I worked in the various departments and worked on some of the machines, both the stemming machine and the cigar-making machine.

Q. Would you give us a thumbnail sketch, sir, from that point on up to the point where you are now, as to the various places you have been stationed and what your jobs were in the different localities to which you were transferred with the American Tobacco Company?

A. I'll try.

I was transferred from the Louisville branch, the cigarette branch, to the chemical department in Richmond, Virginia, in June 1931. And I worked in the research department then, or the chemical department as it was called in those days until the fall of 1932.

Then in the fall of 1932 I was transferred to the Virginia branch of the American Tobacco Company, which is the factoring that makes cigarettes.

I worked there until the summer of 1933. Then I was transferred to Durham, North Carolina, in July 1933, and I remained there until 1957, at which time I moved to New York, where I am today.

Q. What is your present station in the company?

A. I have the title of executive vice-president, sir.

Q. In your travels from one plant to another and from one job to another, were you ever in a position of being in charge of the making of cigarettes, it being under your jurisdiction?

A. Yes. I did everything from running a machine in overalls up to being in charge of the manufacture.

Q. While you were making cigarettes or while you were in charge of making cigarettes, was there a brand known as Lucky Strikes?

A. Yes, sir.

Q. And when did you first start to making Lucky Strikes for the company, or when did you participate?

A. Actually, I made them, sir, in 1933.

Q. Is there any difference in the Lucky Strikes at that time and the Lucky Strikes as of this time?

A. No, sir.

Q. Will you tell us briefly what kind of tobacco goes into the Lucky Strike cigarettes or a cigarette? It doesn't make any difference. We are talking about cigarettes generally.

A. Generally speaking, cigarettes contain four types of tobacco: the so-called bright tobacco, which is

grown here in Florida and South Carolina and North Carolina and in the Virginias.

MR. HASTINGS: Your Honor, may we approach the Bench a moment?

(Side Bar Conference out of the hearing of the jury.)

BY MR. BRADFORD:

Q. Let us continue with the component parts of cigarettes.

THE COURT: You were on the subject of bright tobacco and you stated about where it came from. Now, you didn't say how much or anything further than that.

THE WITNESS: As I said, the bright tobacco came from Florida, Georgia, Carolinas and Virginia.

The second major component in a cigarette is burley tobacco, which is grown in the limestone country up in Kentucky and Tennessee and in the hill country of western North Carolina, Virginia, West Virginia, southern Ohio, Indiana, Illinois and some is grown in western Missouri.

The third type is Maryland, which is grown east of Baltimore and Washington but west of the Chesapeake Bay area.

And the fourth type is the so-called Turkish

tobacco from the Mediterranean countries, mostly Greece and Turkey.

BY MR. BRADFORD:

Q. Are those four types of tobacco included in cigarettes?

A. Yes, sir.

Q. Do you smoke?

A. Yes, sir.

Q. How long have you smoked?

MR. HASTINGS: I don't think this is relevant, your Honor.

THE COURT: Never mind.

MR. BRADFORD: I was leading up to something, but I will have to ask--

BY MR. BRADFORD:

Q. Sir, do you have a job of testing the smoke in cigarettes just as to the flavor or the taste?

A. Yes, sir. I try our products regularly and our competitors.

Q. You say regularly. How often do you try your own products and your competitors' products for taste?

A. Well, during the week, the days when I'm in the office, sir, I have samples sent up from the

production of all our cigarettes. And then we buy our competitors cigarettes, and I will try the competitors against our, or I will try our own to see that they are consistent and uniform.

Q. What about the materials that are sent in that go to make up the cigarettes, such as paper or sugar or anything that is within the cigarette? Does your laboratory or your organization set up any standard for the quality of material that comes in, that is not manufactured in the plant?

A. Well, sir, when we go out to buy wrapping material for cigarettes or any other products that we might manufacture, we tell them what we want, and then we take samples to see that the product that we have specified is delivered.

Further, when we receive a boxcar, say, of cigarette paper, we draw samples from this boxcar and test it in the research and chemical laboratory, and we also take samples and manufacture cigarettes at that time when it arrives.

Those cigarettes, then, are submitted to a panel at the factory level and they smoke the cigarette that represents this particular sample. This happens ahead



of time that we use the material.

In other words, we have the individual's opinion and we have the research report. And if everything is okay, then, when the time comes, the material is used in manufacturing.

Q. Are there any levels between the plant after you make the sample run, so to speak? Is there a further test made before the product actually is put on the market for consumption by the public?

A. We have samples sent in, sir, every week from the various factories, and these samples are submitted to the man in the manufacturing company to smoke, in the manufacturing department.

Q. Then after the product is made, if you decide the samples are all right and the product meets a standard, after the product goes into production and is sold out in the open market, are there any further checks made on the product to see whether or not it lives up to the standard that has been set up by the company?

A. Well, our research department is testing both our cigarettes and our competitors' cigarettes. And they obtain their samples by going into a store at different locations and buying cigarettes just as if they were outsiders.

And the cigarettes are then brought in and tested--our cigarettes as well as our competitors.

Q. How many men on the high level do this type of work besides you in the last analysis or in the last test of this product?

A. The men that are associated with me in the manufacturing department in New York receive samples similar to the ones I receive and they smoke it.

Q. Did you bring here at my request some of the leaves that we are talking about, of different kinds of tobacco that go into the cigarettes that have been sent here by you?

A. Yes, sir. It is my understanding they are here.

Q. Would you mind looking in the box so we'll know what we are talking about, talking about a tobacco leaf?

MR. HASTINGS: Your Honor, we feel that this is rather far removed.

THE COURT: I don't think the jury is chemically minded enough to be benefitted by the exhibition of a tobacco leaf. They probably all have seen some. I know I have; but still I wouldn't know too much about it

or any more if I did or did not see it.

Q Could you tell us how much tobacco has grown in the United States over an average of the last five years?

MR. HASTINGS: Your Honor, the economics are not important here, I do not think.

THE COURT: I will sustain the objection. I think it is too far afield. We all know there is a great deal of tobacco grown in the United States.

BY MR. BRADFORD:

Q Could you tell us the approximate percentage of tobacco grown in the United States that goes into cigarettes?

A Better than 90 per cent goes into cigarettes.

Q Do you know how many cigarettes are manufactured in the United States each year, approximately?

MR. HASTINGS: Again, your Honor, I do not think that goes to the issue in the case.

THE COURT: I will sustain the objection.

BY MR. BRADFORD:

Q What about the level of personnel who are responsible for the making of the cigarettes in the factories, those people who supervise or manage and watch over the product as they go into cigarettes to see that your standards are maintained? Give us a thumbnail sketch of what type people they are from an educational point of view.

A Sir, in our leaf department, which is the

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department that buys the tobacco, we try to employ there men that come from rural areas where they have some knowledge of the growing of tobacco.

Of course, we want to get the best men and we certainly welcome men that not only have knowledge of tobacco but that have at least a high school education.

In the factories we do not investigate the knowledge of the growing of tobacco. We want men that have finished at least high school or preferably that have had some college training.

Q Does American Tobacco Company have a medical department, as such, for research?

A No, sir.

Q I am talking about health problems.

A No, sir.

Q Does the American Tobacco Company make any grants to---

MR. HASTINGS: Your Honor, once again---

THE COURT: Sustained. We will assume American Tobacco Company are nice people.

MR. BRADFORD: May we approach the Bench?

THE COURT: I have ruled on it. Please proceed.

You can ask him what information American

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Tobacco Company elicits with respect to their product and all that sort of thing, if you like.

BY MR. BRADFORD:

Q Does the American Tobacco Company solicit any information from any health organizations such as the American Medical Association or any laboratories in universities such as the University of Virginia or any other colleges or laboratories that engage in investigations of health problems?

MR. HASTINGS: I think, again, this goes to the knowledge question as to what knowledge they might have or not have.

THE COURT: It might go as to the fact that the product is believed, by other than them, to be generally safe.

MR. HASTINGS: This is the opinion of what other groups are.

THE COURT: He has not asked that yet. He can ask him if they solicit that information on a health basis and from what source they solicit it. It might lead to something. I don't know.

MR. BRADFORD: This is in direct line with counsel's opening statement that we did nothing toward research and the health problem at all. This is in rebuttal of that opening statement.

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THE COURT: I do not think it is an issue.

I told counsel on the other side it was not an issue whether you did or did not. The issue was the reasonable safety of this product.

BY MR. BRADFORD:

Q Do you understand the Court's ruling? You cannot go into anything they told you, but whether or not you did solicit information from these institutions.

THE COURT: And what institutions you solicited it from and so forth, if you like. Go ahead.

THE WITNESS: In the scientific area, the study of tobacco, we did have some work done in some colleges.

BY MR. BRADFORD:

Q Name some of those for us, please.

A The University of Chicago, Southern California, Tennessee, North Carolina.

MR. BRADFORD: I believe, your Honor, that is as far as I can go with your Honor's ruling?

THE COURT: You can ask him why he has the work done or for what purpose it is directed.

BY MR. BRADFORD:

Q For what purposes is this work done, sir, in the institutions?

MR. HASTINGS: We object, your Honor.

THE COURT: Proceed. Overruled.

THE WITNESS: I know that the research department tries to stay abreast of the various problems that come up. They are not specialists in this field. So, they make a grant to a college to pursue a certain subject and get a report from them.

MR. BRADFORD: You may inquire.

CROSS EXAMINATION

BY MR. HASTINGS:

Q Sir, the laboratories that you speak of at the American Tobacco Company--that is located where?

A Richmond, Virginia.

Q That laboratory where you are testing flavor and taste--are you testing for carcinogenic substances?

A No, sir. I said cigarettes were sent to me for taste and smoking qualities, physical qualities, shape, appearance, packaging of the cigarette. I do smoke them and taste them.

Q You are not testing for carcinogenic substances, you or the laboratory?

A No, sir.

Q Counsel asked you whether you solicited information from various organizations of which you mentioned the American Medical Association.

You are aware of the fact that the American Medical Association has taken a stand, have they not, on the question---

MR. BRADFORD: Just a minute. I move that be stricken.

THE COURT: It will be stricken.

MR. HASTINGS: Well, he brought it out.

THE COURT: He did not bring out anything about what the American Medical Association said. It does not make much difference what they said in this case.

MR. HASTINGS: That is all.

(Witness excused.)

Thereupon:

ROBERT HEIMANN

was called as a witness on behalf of the Defendant, and being first duly sworn, was examined and testified on his oath as follows:

DIRECT EXAMINATION

BY MR. BRADFORD:

Q Please state your name.

A Robert Heimann.

Q Sir, tell us what your position is with the American Tobacco Company.

A I am Vice-president, a Vice-president.



Q How long have you been with the American Tobacco Company, sir?

A I have been with the company eleven years.

Q What was your employment before that, sir?

A Prior to coming with the company, I was managing editor of Forbes Magazine of Business.

Q What are your duties generally now with the American Tobacco Company?

A I am in charge of the marketing and public relations.

Q Give us a little sketch of your educational background, sir.

A My Bachelor's Degree was from Princeton. I took a Master of Arts Degree at New York University and a Ph.D. at New York University.

Q Have you occupied the position that you now occupy with the company since you came with it, sir?

A No. I began as executive assistant. Later as assistant to the president.

Then I was elected a director and I have been vice-president since January of this year.

Q Sir, tell us what the tobacco plant is in relation to its family.

Does it have a family that it belongs to?

A Yes. It is one of a group of to-flowered plants that includes potato, petunia, tomato.

Q Do you know what the origin of tobacco is, the name, and where it came from?

MR. HASTINGS: I think it is immaterial, your Honor, in terms of the fitness or wholesomeness of the product.

THE COURT: Well, he must have something in mind. Let us pursue the subject awhile and see if he does.

THE WITNESS: The scientific name is derived from a man by the name of Nicot, Jean Nicot, who introduced tobacco to France in the sixteenth century.

BY MR. BRADFORD:

Q Where was tobacco first grown as a commercial product?

A As a commercial product, so far as the old records indicate, the early Spanish and Portugese possessions in the West Indies, particularly Cuba, Santo Domingo and on the East Coast of Brazil. This would have been in the early sixteenth century.

Q Is tobacco grown in other places than in the United States?

A Oh, yes. It is grown in Canada, Mexico, Brazil, still some in the West Indies. It is grown in China, Japan. It is grown in Greece, Turkey, Italy, France.

I may have left out a few countries, but it is quite widely grown.

Q Can you give us a little sketch of its history in this country as a commercial product?

MR. HASTINGS: I think this is far afield.

THE COURT: I do not think we need that.

MR. BRADFORD: Sir?

THE COURT: I do not think we need that. We all have a slight knowledge of that situation.

BY MR. BRADFORD:

Q Can you give us any information as to the tobacco, any committee or any organization that is composed of those who make tobacco that may investigate or deal with health problems? Is there any such organization?

A Yes, there is.

MR. HASTINGS: Again, your Honor, I do not think that goes to the question here as to whether or not cigarettes are or---

THE COURT: I think he is leading up to identifying some other witness along the line.

MR. HASTINGS: If it is being offered for that purpose---

MR. BRADFORD: I have a witness who is coming in from one of the organizations.

THE WITNESS: One organization was formerly known as the Tobacco Industry Research Branch. Its name has recently been changed to Council on Tobacco Research, U.S.A. This is an organization that has been in being since January of 1954. It awards the grants for scientific study in connection with tobacco, with smoking.

BY MR. BRADFORD:

Q Is the American Tobacco Company a member of that organization?

A We are one of the sponsoring organizations and help support it, yes.

Q Do you know who the head of that organization is at this time?

A Dr. Clarence Cook Little.

Q. Referring to Dr. Clarence Cook Little, who is the head of this society, he is not a medical doctor, is he?

A. I believe he is a scientist. I don't know that he is a medical doctor. I'm not sure what his doctoral degree is.

Q. How long have you known Dr. Clarence Cook Little?

A. How long have I known Dr. Little?

Q. Yes.

A. Since he came with the T.I.R.C., which would be since 1954. Some time early in 1954.

Q. And during that ten years, you don't know whether he has or has not an M.D., a medical degree?

A. No, I have never asked him what his degree was.

MR. HASTINGS: That's all.

THE COURT: That's all. You may step down.

(Witness excused)

Thereupon--

DR. THOMAS J. MORAN,

was called as a witness by the defendant and, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRADFORD:

Q. Will you tell us your name, please, sir?

A. Thomas J. Moran.

Q. Where do you live, sir?

A. [DELETED]

Q. Would you keep your voice up just a wee bit so the noise overhead from the air-conditioning won't drown you out, sir?

A. Thomas J. Moran, [DELETED]

Q. What profession do you have, sir?

A. I am a physician.

Q. How long have you been a physician?

A. About 28 years.

Q. Do you have any specialty, sir?

A. Yes, sir. I am a pathologist.

Q. How long have you practiced pathology?

A. The same number--well, 27 years, one less.

Q. Have you confined your practice to that field, sir?

A. Yes, sir, I have.

Q. Where were you born?

A. Near Pittsburgh, Pennsylvania.

Q. Will you give us a little thumbnail sketch of your educational background, where you went to school and college and fitted yourself, so to speak, for the medical profession?

A. Well, I attended Langley High School in Pittsburgh, and I went to college at the University of Pittsburgh, then to the medical school at the University of Pittsburgh.

Then I took my internship at Mercy Hospital in Pittsburgh-- Shall I go on with my other work?

Q. Yes, sir.

A. Then I took residency training, a period of training in pathology at the Pittsburgh City Hospital in Pittsburgh. Then I became director of laboratories at that same institution. And then I was in the United States Navy for four years, in the Medical Corps.

Then I was one year in Evansville, Indiana, as a hospital pathologist in charge of the laboratory and in charge of the tumor clinic.

Then I was four years in Denville, Virginia,

as director of laboratories and director of the hospital tumor clinic.

Then I returned to Pittsburgh where for four years I was director of laboratories at St. Margaret's Hospital in Pittsburgh and director of the John C. Oliver Research Foundation and Assistant Professor of Pathology at the School of Medicine, University of Pittsburgh.

Then I moved over to become director of laboratories at the Presbyterian University Hospital, which is the main teaching unit of the medical center at the University of Pittsburgh. And I was associate professor of pathology and then professor of pathology there.

During this time I was also in charge of the University Medical Center Tumor Clinic, and I was in charge of the residency training program and in charge of the intern training program at the medical center.

Then in 1962, I left the University of Pittsburgh and returned to Denville, Virginia, where I am now the director of laboratories, director of the Tumor Clinic, and I am also a medical examiner in charge of medico-legal autopsies for the State of Virginia.

Q. You said you were a pathologist. What is a pathologist, just briefly?



A. Well, in broad terms, pathology is defined as the study of disease, but more specifically it deals with the diagnosis of disease particularly. And the pathologist is in charge ordinarily of the hospital laboratory. He is responsible for the examination of all surgical specimens that are removed in the operating room. Any tissues removed in the operating room come to the pathologist. He examines it grossly and microscopically and then makes a diagnosis on it.

He is also in charge of all the autopsies that are performed at the hospital, and he is also in charge of what is called the clinical laboratories, that is, the diagnostic part of the laboratories where chemical determinations are done, sugar determinations for diabetes, where blood tests are done, where blood transfusions are set-up and the bacteriological tests are done to determine the kind of organisms that cause infection.

Q. You mentioned specifically the tumor clinic. Would you give us a thumbnail sketch of what a tumor clinic is?

A. Well, the tumor clinics are organizations that are usually associated with hospitals where either patients are seen who have tumors that are suspected of

being cancer, or where the charts of patients are reviewed by a group of men from the medical staff who consult on the diagnosis and then on the management of tumors. They make recommendations to the doctor who is taking care of the patient.

Q. Do you do any work in the tumor field, yourself, such as the examinations of specimens and checking slides and doing things of that nature?

A. Yes, sir, that is the constant part of my work, the diagnosis of slides and of cancer found in slides, which takes up most of the time of almost any pathologist.

Q. Going back to your qualifications, would you tell us some of the societies that you are a member of that have to do with your field of practice?

A. I am a Member of two state pathology societies, the Pennsylvania Association of Pathologists and the Virginia Association of Pathologists. And I am a Member of the American College of Pathologists, the American Society of Clinical Pathologists, the American Society for Experimental Pathology, the American Association of Pathologists and Bacteriologists. And I am also a Member of the International Academy of Pathology.

I am a Member of the Pathological Society of Great Britain and Ireland. And I am a Member of the College of Pathologists in Great Britain. I think those are all the pathology societies.

Q. Are you a Diplomate of the American Board or not?

A. Yes, sir.

Q. Would you tell us briefly how you become a Diplomate of the American Board?

A. Well, the American Board of Pathology, like other specialty Boards, is made up of men who have become recognized as experts in a certain field. And they set up a program under which other men may qualify for this.

In other words, when a man finishes his internship program and if he wants to become a specialist, he will usually take a residency program in this specialty, whether it be pathology or surgery or whatever it may be. And then after he completes a course of training which is set-up by the Board of Pathology, he is then eligible to take the examinations of that Board.

And if he passes that Board, he is then certified as a specialist by the Board in which he takes the examinations.

Q. Is that one examination, Doctor, or more than one?

A. Well, it may be one or it may be several examinations.

In my own case there were two separate Boards in pathology. One is called pathological anatomy and the other is called clinical pathology. And I have passed both those Board examinations.

Q. Have you held any official positions with any of the organizations that have to do with pathology?

A. Yes. I was president of the Pittsburgh Society for pathology, and I was president of the Pennsylvania State Pathology Society and vice-president of the Virginia Pathology Society.

Q. Do you have anything to do with anything like the publishing of any publication that have to do with pathology?

A. Well, I am on the Publications Committee of two national publications: one is called Gerontology and the other is called Gerontologist. These are not specifically in pathology, but they are journals dealing with the problems of the aging.

Q. Do you have anything to do with any cancer

societies or associations? Do you hold any position in any of those?

A. Yes. I was formerly on the Board of Directors of the Virginia Cancer Society, and I am at present on the Board of Directors of the Denville Cancer Association, the Denville Heart Association, and the Basil Browder Health & Research Foundation.

Q. Have you written or published any articles having to do with pathology and, particularly, lung pathology?

A. I have published approximately 40 articles. Most of them have dealt with some aspect of lung pathology.

Q. Have you lectured at any places other than to students in colleges on lung pathology or cancer, at tumor clinics or things of that nature?

A. Yes. I have been invited to give lectures in several medical schools in this country and also in countries in South America. I have lectured at the National University of Caracas in Venezuela and in Bogota, Colombia. And I have been invited several times to speak at the Royal College of Surgeons in London. And I have been invited to an International Conference this coming year in Perugia, Italy.

Q. Tell us a little bit about the size of the hospital department that you now are in charge of in Denville. How many people are there and what kind of laboratory is that?

A. Well, all together there are about 40 people in the laboratory. Seven of them are doctors and the other people are chemists, bacteriologists and medical technicians. We also have a number of young men in training to be pathologists.

I am in charge of the residency training program in pathology at the hospital.

Q. Have you, yourself, done any experimental work in pathology now? We have to leave out animals. They are out of this picture so don't refer to any of the animal work you have done.

A. Yes. I have done a great deal of study and experimental work in human lung cancer.

Q. Would you tell us about how many specimens you have examined, if you could give us an estimate of the examinations of specimens and tissues taken from, say, surgery or that come into your department?

A. Well, that would be in the hundreds of thousands. I don't know the exact figure.

Q. How about autopsies that you have done or that have been done under your supervision, sir?

A. I have performed or personally supervised between 5,000 and 6,000 Autopsies.

Q. How many would you say were lung cancer cases that you have seen in living patients or at autopsy?

A. Again, I don't know the exact figure, but it would be at least 600.

Q. Would you tell us, sir, what is cancer?

A. Well, I'll try to define it simply. Cancer is a condition in which the cells of the body go wild. And instead of growing in the normal fashion to go on and carry out their usual function, they multiply faster than usual instead of functioning in the body. They tend to grow so fast that they form small lumps and then they begin to replace the body tissue and interfere with function instead of carrying on function.

They also break into the bloodstream and spread out to other organs in the body. And this is called metastasis from cancer.

Generally speaking, this growth is of such a nature that it is not controlled unless it is removed or treated in some way. And it usually leads to the death

of the patient.

Q. Could you classify the most common types of cancer for us, the things that we have referred to by name that are most common?

A. Well, there are probably three main groups: there are tumors that are called carcinomas, which are those which are derived from the lining surface or the outer surface, such as the skin or the lining surface of the body. These are referred to as carcinomas.

And then there are cancers that are derived from the supporting structures of the body, the connective tissue and bone. These are called cytomias.

And then there is a third group that is referred to generally as the lymphomas. These are derived from tissues that form lymph nodes and that produce the blood elements in the body.

Q. I note that you referred to tumors and then you said cancer. Are these the same thing or are they different?

MR. HASTINGS: On a point of law on the qualifications, your Honor, may we approach the Bench a moment?

THE COURT: Do you wish to examine him on



his qualifications?

MR. HASTINGS: Yes, sir.

THE COURT: All right.

MR. BRADFORD: Go right ahead.

THE COURT: Proceed.

BY MR. BRADFORD:

Q Is there any difference between using the term tumor and cancer? Is there any difference between them or are they the same thing?

A No. A tumor may be a benign lesion. It may be removed or not even be removed and cause no trouble.

The term cancer automatically means that it is a malignant tumor and is apt to spread and cause death.

Q What parts of the body do we have carcinomas in, the cancer we are talking about?

A We may have carcinoma in almost any part of the body.

It is very common in skin. They are common in the stomach, the intestinal tract, the lung, the liver, the esophagus, kidney, bladder, uterus in the female, breast in the female. These are all common sites.

Q Have you examined the lungs that have been taken from people who have smoked and those that have not smoked where there is cancer present?

A Yes, sir.

Q Can you tell by looking at a lung of a person where the person is dead and the lung has been brought to you for examination whether or not the person was a smoker

or a non-smoker?

A No, sir.

Q What about squamous metaplasia? Do you see squamous metaplasia in the lungs and cells of non-smokers or not?

A Yes, sir.

Q Explain what cases you see it in and where you see it.

A Well, we may see squamous metaplasia in many conditions in the lung; and many benign conditions, any lesion which will produce chronic inflammation, any long-standing inflammation, such as a lung abscess, bronchiectasis.

It is very common in viral diseases, such as influenza.

It is very common in vitamin A deficiency and it may be seen along with a great variety of other things.

Q Where you have a squamous metaplasia, does that invariably go into cancer or can it reverse?

A It does not go into cancer. It may revert. It is a benign lesion.

Q When you say "revert," what do you mean by that?

A It may go back to a perfectly normal state or simply stay as squamous metaplasia.

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Q What about cilia? Tell the jury what you refer to when you say cilia in a person.

A Well, the cilia in the lung are part of the cell in the bronchials and in the bronchi, that is, the tubes leading to the lung.

Those cilia are an integral part of a cell. They have a specific function which is an attempt to help in getting the debris out of the lung.

Q Would a chart help you show the area where we are talking about, where these cilia are found in the body?

A Well, I can show it on a chart, yes, sir.

MR. HASTINGS: We have attempted all through the trial to get our charts in. So, we will object to this one.

THE COURT: He does not want to offer the chart. He wants to use it to illustrate.

MR. HASTINGS: May I see it?

MR. BRADFORD: Yes.

MR. HASTINGS: All right.

THE WITNESS: This area is what is called the larynx or the voice box (indicating). This is the trachea which leads down into the lung, and in this area from about here to about here the cells are what we call a tall columnar epithelium and these are lined by cilia. So, approximately

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this area here would have ciliated cells in them.

It would also go down into these branches here, but they are very small divisions where the actual breathing is done and there is no cilia there.

BY MR. BRADFORD:

Q Doctor, what is the function of the cilia?

THE COURT: He said to remove debris.

BY MR. BRADFORD:

Q Doctor, in severe cases of bronchiectasis, does that have any effect on the cilia?

A Yes. The cilia may be completely destroyed.

Q What happens if the cilia is destroyed? Does it rehabilitate itself?

A Yes. As healing occurs the cilia will grow back in.

Q Does a person live in case the cilia does not grow back in if there is a general infection that kills it off, so to speak, or kills off the top layer of cells?

A A person may live temporarily without any cilia. Patients with influenza lose their ciliated cells very rapidly, with influenza or pneumonia. These regenerate and the patient gets along all right.

Q In lung cancer cases where lungs have been removed and the people have died and you have a history of

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smoking, do they have cilia present or not?

A Yes, they do.

Q Would you tell us if there is any loss of cilia and, if so, where it is lost?

A Usually in the areas where the tumor grows. The tumor will grow into the bronchial tube and completely replace the cilia.

In other parts of the lung away from the cilia-- away from the tumor--the cilia may be normal.

Q Have you seen this in smokers?

A Yes, sir.

Q In the examination of people who have died who have had lung cancer and you have examined the lungs and examined the bronchial branches you have been talking about and you find the cilia still active in that part of the body?

A Yes, sir. I don't necessarily mean all cilia are present. I wouldn't be able to say that. Many areas have perfectly normal cilia.

Q Would you tell us which cells are the columnar cells that you were talking about, the ones that line the wall of the bronchial branch?

A Well, I'm not sure what you mean. They are the cells in the first part of the bronchial tree. They are the ones that are elongated and have the cilia at the end of

them and are the ones that help in the clearance of the debris.

Q What are the names of those cells? What would you classify those as?

A They are referred to as ciliated columnar epithelial cells.

Q What are the cells immediately behind the epithelial cells?

A There is a layer beneath that tall columnar cell which is ordinarily referred to as a reserve cell, reserve layer of cells.

Q Are they of the same name or same general type or not?

A They do not look the same morphologically, but they are the cells from which the tall columnar cells are produced.

Q Doctor, tell us some of the things that produce the change of these cells from a normal cell to a cell that may be called metaplasia, or squamous metaplasia.

A Well, I think I covered that in saying---

THE COURT: He has given several additional diseases and infection that he says destroy part of those cells.  
BY MR. BRADFORD:

Q Do arthritic conditions have any effect on this

type of cell?

A Not directly, to my knowledge. It would have to be from involvement of the lung to produce that.

Q Tell us the frequency, if you know, of the migration, so to speak, or of the metastasis, cancer that starts some other place and goes to the lung.

A This is very common. The lung is the most common site of metastatic tumor because all blood from the body has to go to the lung by virtue of the venous blood from the entire body which goes to the lung in order to get rid of its carbon dioxide and to pick up oxygen. Therefore, all blood goes through the lung and to the lung capillaries.

For this reason it is very common to get secondary tumors in the lung.

Q When we talk about squamous cells, are the squamous cells in other parts of the body of the same type as in the bronchial or in the lung that we have been talking about?

A Yes. There are many sites of squamous cell carcinoma in the body.

Among the common ones are the esophagus, the cervix in the female, the kidney, the gallbladder, the larynx and many other areas.

Q What about the vital statistics, particularly



the United States vital statistics that carry the number of deaths from lung cancer?

Do they break their designation down into primary lung cancer or histological types of cancer or not?

A I think they attempt to break down--they try to break down whether it is primary or secondary. I do not believe they ordinarily break it down into types.

Q Are there different types of lung cancer?

A Yes, there are.

Q Tell us the types.

A Well, there are many different classifications. I suppose there are almost as many different classifications of lung tumors as there are pathologists.

A fairly common system is dividing into roughly four or five large groups. One is the so-called squamous or epidermoid type cancer, and that can be subdivided further into whether it is well differentiated or moderately differentiated.

Then there is a so-called undifferentiated cancer. That can be subdivided further, and these are often mixed types.

Then there is the so-called adenocarcinoma which is made up of glandular forms, and then there is a so-called alveolar cell carcinoma which is derived right from

the sac in which the breathing is actually done.

The fifth group that some people put in is a mixture of various types squamous and adenocarcinoma, for instance. They may both be seen in the same slide.

Q About the alveolar, where is that located physically in the lung, what part of it?

A That is the outermost part of the breathing unit. That is the area where the actual exchange of gas takes place. That is the smallest unit in the lung.

Q Doctor, do you know what causes lung cancer?

A No, sir.

Q In your studies and in your research, have you attempted to find out or try to find out the cause of lung cancer?

A Yes, I have tried to study it and I have tried to read everything I can on it, but I just don't know the cause of it.

Q Doctor, what about the appearances of the cancer in different parts of the body, that is, squamous cell cancer as compared to the lung? Do they look any different?

A No. A squamous cell carcinoma looks exactly the same in the lung as it does in the cervix of the uterus or in the esophagus or any place else.

Q What about the adenocarcinoma?

Does that look any different in the lung than in any other part of the body?

A No. The same thing is true of the adenocarcinomas. You cannot tell from the appearance of the tumor under the microscope or from the way it behaves what organ it is from.

Q Doctor, did you bring with you at my request some slides of skin and lungs showing the lungs of different people, that is, smokers versus non-smokers?

A I brought some slides showing some normal lung and some squamous metaplasia and some cancers both in smokers and non-smokers, yes.

Q Who made those slides?

A I did.

Q Who made the examination of the lung from which those slides were made?

A I did.

MR. BRADFORD: We would like to offer those, your Honor, just for examination by the jury.

MR. HASTINGS: This is what I wanted to show the other day and was not permitted to show under objection of counsel.

~~MR. BRADFORD: These were made by this man.~~

MR. HASTINGS: Mine were made by my man.

THE COURT: I do not think we need the slides. Nobody has disputed that the slides can be deciphered by people like the doctor here.

I think what we are interested in, Mr. Bradford, is their opinion. I do not believe any of us are expert enough to embellish that opinion or to detract from it one way or the other.

BY MR. BRADFORD:

Q Doctor, is lung cancer something new, just discovered or recently discovered?

A No, sir.

Q How long has lung cancer been diagnosed and known to exist in people, as far as you know?

A Well, I don't know the exact date, but certainly the history of lung cancer goes back several hundred years and it has been widely recognized and diagnosed for a hundred years or more.

Q In your experience, have you seen epidermoid lung cancer in non-smokers?

A Yes, sir.

Q Have you seen it in smokers?

A Yes.

Q What about adenocarcinoma?

Have you seen that type of lung cancer in smokers?

A Yes.

Q Have you seen it in non-smokers?

A Yes, sir.

Q Do you have any reasonable medical opinion as to whether or not the smoking of cigarettes has any bearing upon lung cancer?

MR. HASTINGS: Just for the record, your Honor, we would like to object based upon our memorandum.

THE COURT: Overruled.

BY MR. BRADFORD:

Q Do you have an opinion, yes or no?

A Would you ask the question again, please?

Q Can you say with reasonable medical certainty that smoking of cigarettes is the cause of lung cancer in the public?

A No, sir.

Q Do you know what does cause lung cancer or cancer in any other part of the body of a human being?

A No, sir.

Q Are there investigations that you know of into the causes of lung cancer in particular?

A Yes, there are many investigations and a great

deal of research going on all over the country in an attempt to determine the cause of lung cancer.

Q Would you tell us some of the things that are being investigated as the possible causes of lung cancer?

MR. HASTINGS: Your Honor, I think we are going afield now.

THE COURT: Well, within his personal knowledge, not hearsay knowledge, but personal knowledge.

THE WITNESS: Yes, sir. In my own personal knowledge there are experiments going on and work going on in an attempt to determine whether viruses cause lung cancers, and there are attempts to find out whether atmospheric pollution, industrial exposure, and people are studying genetics to determine whether it is a family type disease, an inherited type disease, and there are many other things going on.

Q Have you had occasion yourself to examine the lungs of people who are smoking to see whether or not there is an eddying around, so to speak, of smoke in the lung and the various branches?

A No, sir, I have not done anything like this.

Q What about the frequency of cancer in the trachea or from the voice box on down?

Tell us your experience as to whether or not

they are frequent, infrequent or what as compared to lung cancer.

A Cancers of the trachea are very rare.

Q How about the windpipe or bronchial tube on down to the lung itself?

A Well, as I said, the cancers in the trachea are very rare; but at the point where the trachea divides and becomes what is called the bronchi and the bronchial tubes, then cancer is quite common.

Q On the chart, for the purpose of demonstration here, tell us what area you are talking about--where it is most common.

A Well, this is the area where it is rare, this area right here (indicating). In the area where it becomes common is where this splits and divides where it goes out this way and this way on both sides. Those are the common areas for lung cancer.

Q What about your experience as to the ratio of lung cancer between men and women?

A Well, the ratio is much higher, the incidence is much higher in men than it is in women.

Q Can you give us a figure as to your experience there?

A Well, I would have to estimate that. I would

estimate that in our series about four or five men to one woman.

Q Tell us whether or not the gap between the men and women is growing wider or more narrow.

THE COURT: In your experience.

THE WITNESS: I do not know the answer to that in my own experience.

BY MR. BRADFORD:

Q Would you describe for us as best you can, give us a word picture, of what your slides show as between those that were taken of people who have been smokers and those that have not been smokers.

A Yes. The slides that I propose to show showed several normal lungs and then showed a lung in a man who had never smoked with areas of squamous metaplasia in it, and then I had several slides of a lung cancer that developed in a man who had been a heavy smoker, and it was a squamous cell type.

Then slides of a squamous cell cancer from a man who had never smoked. The idea was to show that the appearance of these are exactly the same.

Then I had a slide of a cancer of the larynx from a man who had never smoked to show that his tumor, again, is indistinguishable in appearance. It is exactly the same



in appearance as the two tumors from the lung.

Then I had some slides from a patient with scleroderma, which is a disease of the connective tissue showing very extensive squamous metaplasia in the lung.

Then I had a slide from a woman with advanced rheumatoid arthritis who had had some lung infection and who had advanced squamous metaplasia there.

Then I had slides from a boy ten years old who had never smoked and who died of a condition called Cushing's disease and had very severe and advanced squamous metaplasia of the lung.

Q Are the squamous metaplasia changes that we have been talking about, in your opinion, precancerous conditions or not?

A No, sir, they are not.

Q Why do you make that statement, sir?

A Well, squamous metaplasia is seen in many benign conditions. It has been followed over a period of many years by examinations and biopsies and has not been proven to progress. It is not linked specifically with cigarette smoking or any other condition.

It may be found in non-smokers, in smokers, and I do not think we can say that squamous metaplasia is a malignant lesion or a pre-malignant lesion or as a lesion

that leads to cancer at all.

Q Have you seen carcinoma in situ in your experience in the lungs of smokers?

A I have not seen carcinoma in situ in the lungs of smokers with the exception that in patients who have lung cancer, both smokers and non-smokers, you may see areas that we call carcinoma in situ.

Q Is it more common or less common to see cancer in more than one spot of the lung if you have cancer of the lung?

A Well, usually most frequently it is present only in one place unless it is secondary cancer spreading from other areas, although occasionally there are multiple tumors. The usual situation is there is only one tumor.

Q What about in both lungs? If you have it in one lung, do you frequently see it in both lungs or not?

A No. Again, with the exception that it may spread through the blood stream from one lung to the other.

Q Do you know of any way to study whether or not cigarette smoke eddies through the bronchial branch and on out to the extreme ends of the branch as the smoker is smoking a cigarette?

A I don't know anything about that.

Q. Doctor, in your opinion, is there a retention in the lungs of particles or parts of smoke as smokers smoke a cigarette?

A. I have never seen deposits in the lung related to cigarette smoke. I have seen deposits in the lung from industrial smoke, from coal smoke that can be found very readily. But I have never seen it from cigarette smoke.

Q. Is there a difference between coal smoke and cigarette smoke, sir?

A. Well, we know from studies of the lungs in coal miners that certain black deposits gather and these are found throughout the lung. And you can recognize these fairly readily under the microscope and grossly; but I don't know of any collection of cigarette smoke in the lung that can be recognized either grossly or microscopically.

THE COURT: Coal miners usually have dust deposits from coal?

THE WITNESS: Well, you can get it either way, because in smoke there are good sized particles of soot which are made up of the same material.

THE COURT: Well, we could all get soot, but in the coal miner, what you are talking about is the dust deposits?

THE WITNESS: That's correct.

BY MR. BRADFORD:

Q. Now, Doctor, what does the lung do when you inhale a big breath of air, whether it contains cigarette smoke or just fresh air? What does the lung in that case do? Does it retain any of it or does it kick it back out, or how does it operate?

A. Well, I'm not sure of the exact physiology of it, but generally the air is drawn into the smallest spaces, the alveolar spaces, and there it is retained long enough for the capillaries to allow oxygen to come into the red blood cells and for the carbondioxide to pass out and then this is breathed back out.

THE COURT: It absorbs the oxygen and discharges the carbondioxide?

THE WITNESS: Yes, sir.

BY MR. BRADFORD:

Q. What about the efficiency of autopsies in the classification of primary lung cancer, sir? Can you tell, from examining the lung of a person after it has been removed, whether or not the cancerous condition found there was the primary or secondary condition throughout an atopsy?

A. If the entire lung is removed--

MR. HASTINGS: I don't think this is material or relevant to the issues in this case. The issue is whether the cigarette is reasonably fit or wholesome. This is a re-litigation of the prior case.

MR. BRADFORD: He reported certain statistics on the number of cases.

THE COURT: Yes, it might affect the statistics somewhat. For that limited reason I will let it in.

If the doctor knows the answer--either he knows it or not.

THE WITNESS: I would say that if an entire lung is removed, it may be possible to give an estimate or an educated guess as to whether it is primary in the lung. However, in order to be absolutely sure, if it is primary in the lung, you have to have an autopsy.

BY MR. BRADFORD:

Q. And if an autopsy is done, is that 100 per cent accurate, or is there some margin of error even in the autopsy?

A. Even in the autopsy there is a margin of error, because some of the tumors which may look the same under the microscope, there may be a large tumor in the

lung, for instance, and a large tumor in the pancreas and a large tumor in the esophagus or many other sites, and it is impossible to be absolutely sure which one is the primary site.

Q. You told us that you had done or had directly supervised between 5,000 and 6,000 autopsies. Have you also been in on and seen or conferred with others regarding any other numbers of that?

A. Yes. I have in the course of my teaching experience gone over approximately another 5,000 or 6,000 autopsies which were performed by other people, but which were used by us in teaching in medical school.

Q. Do you have any opinion as to the percentage of people that come to autopsy who may have died of lung cancer?

A. Well, I would have to guess, and I would guess the total number would be 10 or 15 per cent.

MR. HASTINGS: I object to that and move to strike it.

THE COURT: I think so. I will sustain the objection.

I don't believe the doctor claims to be a man who is dealing with percentages and original

investigations, which is a very different field-- Is it not, Doctor, from your medical field?

THE WITNESS: Yes, sir.

As I understand, the question attempts to find out how many or what percentage of autopsies are performed in the entire country.

THE COURT: Yes; and what they all show and don't show, that is a different field?

THE WITNESS: Well--

THE COURT: That is a mathematical calculation gathered by people engaged in gathering information, isn't it, on a broad scope. Is that right?

THE WITNESS: Yes. I think you would have to estimate that. I know what the percentages are in the hospitals.

THE COURT: Yes.

THE WITNESS: I know those figures.

THE COURT: As a matter of fact, I think the figures are pretty well before us in this trial. I don't believe it has any great--

BY MR. BRADFORD:

Q. Doctor, what has been done toward the development of medical science, training and facilities

and instruments that have aided doctors in uncovering lung cancer in the last 30 years that were not available to doctors before that time; so that now you can better diagnose the condition?

A. Well, there have been great improvements in all diagnostic methods. The X-ray procedures have been improved greatly. Bronchoscope examinations--that is, the introduction of a tube directly into the bronchus has only been performed widely over the last 15 or 20 years.

The introduction of the cytology methods for the detection of lung cancer, which is examining the sputum, the cells in the sputum, to determine lung cancer.

These are some of the improvements in diagnosis.

And then the advent of much more wide-spread thoracic surgery so that actual lung biopsies are done more frequently than they used to be. And the autopsy rates have also increased.

Q. What about the number of people in the hospitals as compared to 30 years ago? Is there a greater number of people who go to the hospitals for this type of service?

A. Yes, there are many more.



MR. BRADFORD: You may inquire, Mr. Hastings.

THE COURT: Cross-examination.

CROSS EXAMINATION

BY MR. HASTINGS:

Q. Doctor, you were speaking of the lung of smokers. In respect to the cilia, did I understand you to say that you find some area where cilia is present but you don't find that all the areas of cilia are present as it would be in the normal person that did not smoke?

A. No, I don't say that all cilia are present, no.

Q. When you speak of carcinoma in situ as you used that term, is that the term that is given to cancer that has not--it is a picture of cancer as you look at it under microscope but actually it is cancer that has not yet invaded; is that what you mean by that?

A. Yes, that's correct.

Q. And, Doctor, is it the epidermoid or squamous carcinoma that is the one that is related or apparently supposedly related to smoking? Is that the type that is the one related to smoking that is spoken of?

A. That is the type which most of the people who have written statistical surveys have said is most

common the lungs of people who smoke.

Q. Doctor, it is true, is it not, in your experience, at least, that the overwhelming number of people who have epidermoid carcinomas are smokers, percentagewise?

A. I would not use the word "overwhelming." I would say that most of the people that I have seen with squamous cell carcinoma have been smokers. I don't know what the percentage of smokers is in the over-all group that I autopsied.

Q. But the majority, sir, of the people that you have seen are smokers who have this type.

A. Yes.

Q. Now, Doctor, you, personally, have not done any specific research, have you, sir, in the pathological field to determine the causal relationship between smoking and cancer?

A. I have not worked directly in animal experiments on the relationship between smoking and lung cancer, but I have studied quite carefully the changes in the mucosa of smokers and nonsmokers.

Q. Doctor, I believe you testified for and on behalf of the tobacco company or another tobacco company

in another trial; is that right, sir?

A. Yes, one other trial.

Q. One other trial. This was where, in Pittsburgh?

A. Yes.

Q. Did they bring you from Virginia down to Pittsburgh to testify?

A. No, I was in Pittsburgh at the time.

Q. I see. And, Doctor, I want to ask you whether you recall at this time this question being asked and whether you recall this particular answer, page 1915-A. I want to ask you if you recall this question and answer.

"Q. Doctor, have you made any specific research in the study, from a pathological study, any specific research into the causal relationship between smoking and cancer?

"A. No, sir."

A. I was using the term "research" to apply to the experimental animals.

Q. You used the term "research," then, did you not?

A. I have done research in human cases, yes, but not in animals.

Q. You didn't qualify it at that time, did you, at this trial?

A. I apparently did not qualify it that way.

Q. Can you tell us what paper, if any, you have published with respect to smoking and cancer?

A. I have not published any papers on smoking and cancer.

Q. Have you written any books or anything with relation to smoking and cancer?

A. No.

Q. Nor have you contributed any chapter in any medical journal?

A. No, I have not.

Q. Doctor, are there carcinogens in cigarette smoke?

A. I don't know.

Q. Have you done any work to determine whether or not there are?

A. I have not.

Q. You mentioned something about this Cushing's disease. We were using medical terms there and I think you mentioned Cushing's disease in some boy that you had autopsied. Was that it?

A. Yes.

Q. Cushing's disease has nothing to do with cancer, has it?

A. No, no, that was the point, to show that this squamous metaplasia occurred in this boy who did not have cancer and who did not smoke.

Q. Have you ever seen or done any experiments in connection with the things that are in the lungs or the things that are done, say, with a handkerchief, blowing through your handkerchief and seeing what, if anything, residual is in there?

A. No, I have not.

Q. Have you ever seen that done, where someone just takes a cigarette and blows through a handkerchief?

A. No.

Q. Doctor, you say that we don't know the causes of lung cancer. You don't know the cause of lung cancer. Isn't it true that an overexposure to X-ray is an accepted cause of cancer, lung cancer?

A. Lung cancer?

Q. Yes.

A. I don't believe so. I don't know of any reports that indicate that overexposure to X-rays causes

lung cancer.

Q. Sir, with respect to that question, I want to ask you if the question was not asked of you on October 31, 1962, when you were testifying on behalf of the tobacco company in Pittsburgh, talking about the causes of lung cancer.

"Q. Yes. The X-ray is an illustration; exposure of an excessive amount of roentgens will cause cancer, will it not?

"A. This has been reported, yes.

"Q. Well, it is accepted, is it not?

"A. I think so."

A. Now, the question as asked there was dealing with cancer in general. You asked me this time whether one cancer has been caused with X-ray, and I don't know of any reports on lung cancer being caused by X-ray.

Q. Then we do know that X-rays can cause cancer, then, even though it is some type of cancer?

A. People have associated particularly the so-called leukemia with radiation. Whether leukemia is actually the same as cancer in other organs, nobody knows yet.

Q. But at that trial you did state at that time that overexposure will cause it?

MR. BRADFORD: I object to that.

THE COURT: It's a form of argument.

BY MR. HASTINGS:

Q. Doctor, what is an epidemiologist?

A. An epidemiologist is a person who deals in statistics particularly applied to health measures.

Q. Does he deal in anything beyond statistics, do you know?

A. Well, I am not sure how broad the definition might be. But certainly the primary function of an epidemiologist is to determine the incidence and the statistical evaluations of different diseases in different locations.

Q. Do they use the statistics to relate whatever the experimental evidence has shown or what the clinical observations have shown, or do they use the sum total of the knowledge available to them or do they just do it statistically?

A. I would think an epidemiologist would use the statistics and would use general knowledge, too.

Q. The interest of the epidemiologist is in determining the cause of the disease. Isn't that what the definition of an epidemiologist is?

A. Well, I don't think so.

Q. Or what an epidemiologist does?

A. I think an epidemiologist is one who determines data on the incidence of disease.

Q. By incidence, we mean the rates of disease?

A. That is correct.

Q. Now, do you believe epidemiological research to be important?

A. Yes, I think so.

Q. I mean in determining or not determining the cause of any disease.

A. Yes.

Q. Would it be fair to say that, without-- well, with respect to this epidermoid type of lung cancer, the lung reported to be associated with smoking, you examined several hundred lungs or so in the last 18 years or so?

A. Yes.

Q. So it would not be unfair to say, in your opinion, cigarette smoking may possibly be a cause of lung cancer?

MR. BRADFORD: Just one minute. I object to that. That is talking about possibilities. We are dealing with probabilities.



THE COURT: I think most anything is possible. We are talking only from the scientific standpoint. That's where our only interest is.

MR. HASTINGS: With respect to air pollution--

THE COURT: Well, he answered what you asked him before on that, you remember.

MR. HASTINGS: Now it is concerning cigarette smoke. He was asked about air pollution and I want to ask him about cigarettes.

THE COURT: Don't ask him what the possibilities are. I will agree almost anything is possible. If we don't know the cause anything could be possible. So far the doctor stated he is not quite sure about any factors.

We all have opinions based upon their medical knowledge and their medical experience. You can ask him his opinion, if you like. I believe you already asked him that and I believe he already answered, and I believe he has already answered as to what he found as respects to people who smoke, et cetera.

Now, let's start from there and not possibilities.

BY MR. HASTINGS:

Q. Sir, would you feel, in a case of lung cancer,

that cigarette smoking would be one of the factors that would have to be considered along with other factors?

A. Yes. I think many factors would have to be considered, in the cigarette smoking.

Q. Sir, you published, I believe, a paper with regard to the pathology of the lung, and one of these papers had to do with a so-called type of what is known as farmer's lung; is that correct?

A. Yes.

Q. And in the development of this farmer's lung, which the farmers get, would it be fair to say that, in your opinion, it was your belief that the breathing in or the inhalation of moldy hay was a so-called cause of that farmer's lung?

A. Well, it was our opinion that this was the best possible explanation available. It seemed to be somehow related to the inhalation of hay, yes.

Q. The actual causes have been obscure, have they not, in that condition?

A. That's correct.

Q. But in your opinion, even though you didn't know the precise factors, in your opinion it was the moldy hay that was probably the likely agent that carried whatever

it was that brought it about?

A. I think that is correct.

Q. Not every farmer that is exposed to moldy hay, though, necessarily got farmer's lung, did he?

A. No.

Q. In other words, just because a person is exposed to an agent, whether it be moldy hay or smoke or whatever it may be, doesn't mean necessarily he is going to contract the disease; is that correct?

A. Well, this is not a comparable situation, because we don't even use the term farmer's lung unless the person has been exposed to the hay. That, by definition, means that while it is true that not all farmers get it, yet you don't have farmer's lung without exposure to hay.

Q. But not everyone who is exposed gets it?

A. No.

Q. There are a great many farmers working with it who don't develop it?

A. That's correct.

Q. And you don't know specifically, however, or precisely, what it is in the hay, or you did not isolate it or, to your knowledge, no one else has isolated what it is in the hay, what the chemical product is that actually

brought it about?

A. That is true.

Q. Doctor, do you know of any studies that have been done to show the fluorescent material in cigarette smoke, particularly in the matter that is actually found within the lungs or within the tissue of the lungs of a smoker?

A. No, I do not.

Q. You never heard of that?

A. No.

Q. Doctor, when you testified in Pittsburgh and for your testimony here, do you expect to be or were you compensated by the tobacco company?

A. Yes, I expect to be compensated.

Q. Doctor, in expressing your opinion, did you take into consideration the opinion of any other group such as the American Cancer Society? Was that a part of it?

A. No, I have not taken that into consideration.

Q. Doctor, do you know, in your field of pathology, what is the largest study that has ever been done on this particular correlation or lack of correlation between smokers and nonsmokers and the development of carcinoma in situ?

A Would you repeat that question, please?

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THE COURT: You are trying to bring in a repetition of your own testimony.

BY MR. HASTINGS:

Q Was that study done in conjunction with another doctor, Dr. Arthur Purdy Stout?

MR. BRADFORD: I object to that.

THE COURT: Sustained. Get off that study.

BY MR. HASTINGS:

Q Doctor, would you recognize as an authority in the field we are talking about in smoking and health the report of the advisory committee---

MR. BRADFORD: Just a moment.

THE COURT: It does not make any difference whether he recognizes it or not.

MR. HASTINGS: If he does recognize it, I have a question on that.

THE COURT: I do not think he will. That is neither here nor there. That is too far afield.

If you want to bring the advisory committee in here, let them get on the stand and testify, but not indirectly. It seems to me---

MR. HASTINGS: That is all.

THE COURT: Do not let me stop you now, but confine this trial to the issues.

MR. HASTINGS: No further questions.

REDIRECT EXAMINATION

BY MR. BRADFORD:

Q Doctor, you testified that you see cancerous lungs in people who do not smoke cigarettes.

Have you ever seen one of these farmer's lungs in a farmer who was not exposed to the farm products you have been talking about?

A No.

THE COURT: You are doing the same thing. You are going far afield on farmer's lungs which we know nothing about, except it is a method of determining cause and effect.

MR. BRADFORD: I only brought it out because Mr. Hastings brought it out.

THE COURT: Because Mr. Hastings does something, Mr. Bradford, it does not require you to do it.

MR. BRADFORD: I will accept the Court's statement.

BY MR. BRADFORD:

Q Sir, Mr. Hastings asked you if counting of noses, so to speak, statistical or epidemiological studies were important.

Do you feel the fact there are frequencies of lung cancer or any other disease that may count numerical

number establishes a scientific fact?

A No.

Q What are the statistics used for? You say they are important.

Do they point the way, or what do they do?

A Well, I think statistics can only be used as a guide. I think to try to give you some clue or lead and then you try to investigate from there to find out what the true cause of a condition is.

Q In your use of statistics in your work, do you accept the counting of noses or the number of people involved in a particular thing as proof of one thing or another?

A No.

Q It does not establish scientific proof, in your opinion?

THE COURT: All the experts have said the same thing. It is a lead in which they may approach a cause.

MR. BRADFORD: No further questions.

(Witness excused.)

THE COURT: We will take a ten-minute recess.

(Short recess taken, after which the following proceedings were had:)

Thereupon--

ARTHUR G. CONOVER.

was called as a witness by the defendant and, having been first duly sworn, was examined and testified as follows:

THE COURT: State your name, address and your occupation.

THE WITNESS: My name is Arthur G. Conover. I am a research agricultural economist in the United States Department of Agriculture. My address is  
[DELETED]

THE COURT: What is your educational background and your qualifications in your particular line of endeavor?

THE WITNESS: I am a graduate of Rutgers University, New Brunswick, New Jersey, with an AB Degree. I have a Master of Arts Degree from the American University in Washington, D. C. in economics. I have a substantial number of credits toward a Doctor of Philosophy Degree in economics at American University and the United States Department of Agriculture graduate school.

MR. BRADFORD: Your Honor, I do not intend to ask Mr. Conover any opinions. He is here for the purpose of giving statistical information and a recitation of factual



matters in his department.

THE COURT: All right, go ahead.

DIRECT EXAMINATION:

BY MR. BRADFORD:

Q. Sir, in your work in your department, do you have a specialization, so to speak, or do you confine your work to a particular phase or subject?

A. Yes, I am the head of the Tobacco Section in the Economic Research Service of the Department of Agriculture. The responsibility I have in that capacity is to analyze the factors that affects consumption, supply of tobacco, the prices of tobacco, the prices of tobacco products, and the international trade aspects of tobacco.

Q. How long have you been in this department?

A. I have been with the Department of Agriculture since 1934.

Q. Does the Government gather statistics regarding the uses of tobacco products in the United States?

A. The government gathers a good many statistics on the consumption, trade, manufacture, supply data, stocks, prices, and a vast realm of statistical data.

Q. How does the government gather statistics as to the number of people who used tobacco in the United States?

A. Well--

Q. Just briefly tell us how you acquire that information.

A. Well, in 1955 there was--

MR. HASTINGS: I don't know that this is relevant, as to the economics of tobacco, unless the doctor has gathered these statistics himself. This may be from what some other people have done. I don't believe he did them.

MR. BRADFORD: Let's wait until we get to the point.

BY MR. BRADFORD:

Q. How do they get the number of tobacco users in the United States, if they do gather that?

A. There is no currently regular schedule of gathering statistics on the number of smokers. There are estimates prepared from surveys plus other relevant data.

A national survey was taken in 1955 by the Censors Bureau, which is a bureau of the Department of Commerce.

In this survey of a national sample, they obtained data on the number of smokers of various products

and rates of smoking. And from this data for several years in the Department of Agriculture we have established, by computing percentage relationships to the Censors estimate of population, the approximate number or the estimates of numbers of smokers.

Q. Does that take into account occasional smokers or regular smokers?

A. Well, the original survey took into account both of these classifications. The estimating that we have done in the Department of Agriculture has been on regular smokers, those that smoke each and every day.

Q. How many do your figures show that you estimate smoke in the United States regularly every day?

MR. HASTINGS: I don't see the relevancy of that nor the competency. We object to it.

THE COURT: I will sustain the objection. It is too remote. If there is a publication, an official publication of the Bureau of Censors, I'll consider it.

I think we can probably agree if you will just look at the statistics, it will save a lot of time.

MR. IRADFORD: We have it for several years, but I think one year would suffice.

THE COURT: One year will be enough.

Why don't you read the number into the record,

if the thing shows.

MR. BRADFORD: I can give it to him. He knows where it is.

THE COURT: If he doesn't know it, you read it to him from the records.

MR. BRADFORD: I don't even know where to find it.

THE COURT: You will have to let him help you find it.

MR. BRADFORD: Yes, sir.

BY MR. BRADFORD:

Q. Would you tell us whether or not there was an estimated 62,500,000 U. S. persons, including overseas smokers who regularly smoked cigarettes in 1962? That is, just cigarettes. Is that a correct figure or not, sir?

A. That is our estimate.

Q. Would you tell us your estimate of the number of males who smoked cigarettes in the United States in 1962?

A. 37,500,000, approximately, as I remember the figure.

Q. All right, sir. How about females?

A. About 25,250,000.

Q. Were these regular smokers or not?

A. These were regular smokers.

Q. Would you tell us whether or not the compilation of the figures that you have referred to are under your supervision or somebody else's supervision?

A. They are under my supervision.

Q. Have you attempted to calculate and compute the number of cigarettes sold in the United States in 1962?

A. We are continuously estimating ahead of the period the number of cigarettes manufactured and the number of cigarettes consumed. Actually, we have excellent data once a period is passed, from a calendar year. By late February of the following year, we will have all final data that comes from the Internal Revenue Service. That is an excellent and accurate indication of the number of cigarettes smoked.

Q. Would you tell us, approximately, how many cigarettes were manufactured in the United States in 1962?

A. Well, I would have to look at it.

THE COURT: Manufactured and sold, I think he means.

THE WITNESS: I would have to look up the figure. We have an excellent figure on it in this

publication which comes out quarterly. The estimates are contained for the upcoming periods, and the final data are in here for years past.

In 1962 the total output of cigarettes was 535-1/2 billion. The consumption by United States smokers was 508 billion.

Q. Have you broken down, sir, or have you attempted to break down the difference in the city smokers and the country smokers?

A. No, sir.

Q. You have not?

A. No, sir.

Q. I am talking about people who live in the city or people who live in the country?

A. No. We have made no estimate of that.

Q. Do you know the approximate number of families or farmers that produce this crop?

A. Yes.

MR. HASTINGS: I don't think that is relevant.

THE COURT: Sustained.

MR. BRADFORD: You may inquire.

## CROSS EXAMINATION

BY MR. HASTINGS:

Q. Sir, on a per capita basis, in other words, the number of cigarettes smoked per individual in the United States from age fifteen and on has been on a sharp increase, has it not, going back, shall we say, to 1900 or so and bringing it up to the present date?

A. That's correct.

Q. Is it correct to say, Mr. Conover, that the cigarette consumption and the output have set new record highs for six consecutive years? This pamphlet has 1962. As of 1962 and going back six years, there have been new record highs in the consumption of cigarettes?

A. There is a constant new high each year, yes.

Q. And would it be correct also to say, again considering all the people in the United States, whether they smoke or not, considering all the people and dividing the number of people into the number of cigarettes sold-- how many people do we have here, roughly? 180,000,000?

THE COURT: 185,000,000 or 190,000,000.

THE WITNESS: We do not use a total figure when we compute per capita on cigarettes. We do not use the total population.

BY MR. HASTINGS:

Q. You use 15 and over; isn't that correct?

A. We now use 16 and over.

Q. And this is from the U. S. Department of Agriculture?

A. That is correct, that data is.

MR. HASTINGS: Would you have any objection to our using this?

MR. BRADFORD: Yes. He can testify to it.

THE COURT: It would be mere repetition of what the witness testified to or what he would testify.

BY MR. HASTINGS:

Q. Speaking of the annual per capita figure of cigarette consumption in the United States for persons aged fifteen years and over--in other words, if we divided the number of people aged fifteen years and older into the total number of cigarettes sold throughout the entire country, would it be fair to say that in 1900 there was something like 54; in 1910, 139; in 1920, 541; in 1930, 1302; 1940, 1,749; 1950, 3172; 1953, 3356; and in 1954, 3193; and 1958, 3,700. Would that be correct, sir, to the best of your knowledge?

A. That seems reasonable to me, yes.



Q. And since that date of 1958, has there been a continued increase?

A. The per capita consumption has increased since 1958 through 1963.

MR. HASTINGS: Thank you, sir.

MR. BRADFORD: No further questions.

(Witness excused)

MR. BRADFORD: We are now about to read the testimony of Dr. Frazier Payton.

The jury understands that this is the same as if it was taken under oath.

THE COURT: Yes. These are depositions or testimony taken under oath at another time with attorneys present and the witness under oath.

Therefore, it will be received by you with the same force and effect, except that the witness is not on the stand.

MR. BRADFORD: Also, some of the exhibits were lost, and there is a report on those X-rays. The X-rays are not here so anybody could look at it. They have been misplaced, I guess.

THE COURT: Well, some of the exhibits he is referring to unfortunately have been misplaced. He

will describe what they show; but you do not need to see the exhibits because they are not available.

MR. BRADFORD: Reading from page 734 of the trial transcript. This is Dr. Frazier Payton, P-a-y-t-o-n. This is taken from his testimony on July 26, 1960. It starts off with our calling the witness on behalf of the defendant and then it says that the witness was called as a witness on behalf of the defendant, et cetera, and goes on, as follows:

"THE WITNESS: Frazier J. Payton, M. D.,  
radiologist, [DELETED]

"I am a Fellow of the American College of Radiology. I have practiced since 1925, 18 years at St. Francis Hospital on Miami Beach. Approximately four years in the United States Navy in the last war as radiologist at Opa-Locka Naval Station.

"I have been in the private practice of radiology since the war at two other addresses which are no longer used.

"Q. Doctor, where did you receive your medical doctor degree?

"A. At University of Indiana.

"Q. What year?

"A. 1925. I had a residency at the Allison Hospital on Miami Beach which is now known as St. Francis. I was chief of the Department of Radiology there until the war.

"Q. Are you certified by the American Board of Radiology?

"A. Yes, sir.

"Q. What year was that?

"A. 1937, I believe.

"Q. Do you belong to the Radiological Society of North America?

"A. Yes, sir.

"Q. The American Medical Association?

"A. Yes, sir.

"Q. Do you limit your practice entirely to radiology?

"A. Yes, sir.

"Q. Doctor, at my request did you make an examination of all of the X-ray films from the United States Naval Department, the Veterans Hospital, the Victoria Hospital at Opa-locka,

and Mercy Hospital in connection with the films taken at various times from March 11, 1945 through December 8, 1957, covering Mr. Edwin H. Green?

"A. I did.

"Q. At my request, did you make a report of the readings of these various films?

"A. I did, sir.

"Q. Doctor, just for the purpose of definition, what is a radiologist?

"A. A radiologist is one who may have three distinct designations. He fundamentally is one who has knowledge of radiant energy which has to do with diagnostic use of it for X-ray examinations for treatment purposes and in addition he is also able to handle radium. He has the term radiologist which was given to him by the Board. Other than that there are two other designations.

"Q. Within your specialty, is it one of your professional areas to read X-ray films?

"A. Yes, sir.

"Q. And interpret them?

"A. Yes, sir.

"Q. Doctor, in any of these films that you have examined, taking them as a whole beginning to end, do you find any evidence whatever or any bone involvement with respect to Mr. Green?

"A. No, sir.

(Discussion off the record)

MR. HASTINGS: (Reading)

"Q Doctor, in reviewing these X-rays did you have the benefit also of looking at the report as rendered by other radiologists? Did anybody ever show you the hospital report?

"A I remember seeing some, but not all.

"Q Were you advised that the doctors who actually read these X-rays such as I believe at the Jackson Memorial Hospital, the Chief of Radiology there, and by 'radiology,' we mean X-ray, don't we--the Chief of Radiology Department was Dr. Maurice Greenfield in 1953. Is that correct?"

MR. HASTINGS: Over to the next page.

"Q Do you know the radiologist, Dr. Nesbitt?

"A I know of him. I think I met him once, yes, sir.

"Q He reads the X-rays at Mercy Hospital, doesn't he?

"A I think he did but I don't think he does now.

"Q Were you advised that when he  
broad the X-rays back in May, 1956, that  
he said it was bone erosion?

"A No, I don't remember that he did.  
I don't remember even seeing it.

Q I am referring now to Exhibits  
which are in evidence, the reports of the  
Mercy Hospital, and I hand you now the  
report of May 16, 1956, and ask you if you  
would look at it, please.

"A I see it.

"Q Doctor, that report states that  
there has been some invasion into the bone  
around the second rib, doesn't it?

"A No, sir.

"Q Does it state that there is  
erosion?

A No, sir.

Q Does it state that there is  
erosion about that area?

A It does not. It says 'there  
appears to be.'

"Q Does that report state that  
there appears to be invasion, or there

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appears to be? Can we agree on that?

"A It so states.

"Q Now, Doctor, back, I believe, on January 19, 1956, in your examination of the X-rays you first called attention to what you term as a possible early neo-plastic change. Is that correct?

"A What was the date?

"Q The date of 1/17/1956 and 1/19/56, on page 5 of your report.

"A Will you repeat your question, please?

"Q Is that the first time you called attention to what you term a 'possible early neo-plastic change'?

"A Yes.

"Q You didn't mention neo-plastic before this particular date of January 17, 1956?

"A Yes, sir.

"Q Will you explain to this jury what neo-plastic means. You speak of 'possible early neo-plastic change'.

"A It means exactly what it indicates.



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'Neo' means new and 'plastic' means growth.

"Q Is this a term that is used to describe tumors and cancer?

"A By 'tumor,' I assume you mean a swelling.

"Q When you speak of neo-plastic, do you speak of neo-plastic as being cancerous?

"A Not necessarily. It is a new growth, but you have not yet determined whether it is cancerous or not.

"Q But does it include cancers, Doctor?

"A It may.

"Q Does it or doesn't it? Do you know whether it does or doesn't? Does the definition of the word include cancer?

"A Yes.

"Q In other words, you distinguish, when you use the word 'neo-plastic,' you mean as opposed to something such as an inflammatory change, don't you?

"A They may go hand in hand. You may have both.

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"Q I don't think you understood my question. I believe it is not responsive. When you use the word 'neo-plastic,' you don't mean inflammatory, do you?

"A No, fundamentally, it can be both.

"Q In other words, both could be present?

"A That is the reason it is used frequently, because we are not certain.

"Q 'Neo-plastic' means a growth and it includes cancer, doesn't it?

"A Yes, sir.

"Q Doctor, I believe you note a little further along, about two and a half months later, on March 30th, that this particular area that you call 'neo-plastic' seems to have diminished somewhat--'diminished' means decreased, is that right?

"A Yes.

Q '--presumably from some type of therapy' meaning he was getting some type of treatment?

A Yes, sir.

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Q Was it your understanding that he was getting some type of treatment like cobalt, nitrogen mustard?

A There was some hearsay, but I don't remember seeing at any time the complete record.

Q In other words, they have never submitted to you the complete record on this case?

A I haven't seen the complete hospital record.

Q Now, when you do receive therapy, is that a fairly usual thing to see some diminishment?

A If the tissue is responsive to it, yes, sir.

Q Then I believe on June 19, 1956 you call attention to 'tumor in the left apex previously noted.'

A Yes.

Q When you speak of 'previously noted,' you are talking about when you previously called it 'neo-plastic'?

A Yes.

"Q We are now talking about 'tumor,' and we are talking about a tumor, being that word 'neo-plastic.'

"A Not necessarily.

"Q Where you have mentioned the tumor before that you are talking of?

"A I haven't.

Q Does it say, 'tumor in the left apex previously noted.'

"A In that instance, it must have referred to the one that you indicate, stating neo-plastic, and it would therefore be interchangeable.

"Q We are talking about in the left apex.

"A Correct.

"Q And then again I believe on August 13th you are again saying, 'There has been further aggression of the tumor of the left apex.' Is that right?

"A Yes, sir.

"Q Doctor, I think in your final summary, on your last page, you call attention that by January, 1956, 'neo-plastic changes are

to be suspected.' Is that right?

"A Correct.

"Q Then you further state,  
'Subsequent course as judged by X-ray  
findings became more characteristic of  
malignancy,' and we understand by 'malignancy' to be a word that is cancerous?

"A Definitely.

"Q Now, Doctor, you have seen  
the X-rays, but you never reviewed the  
entire record of this man and you never  
examined him at any time?

"A No, sir.

"Q Were you told that a biopsy was  
done in this case?

"A A biopsy of what?

"Q Was any information given to you  
about any biopsy in this case?

"A I believe I was acquainted with  
some tissue having been taken out of somewhere,  
but not in this particular area.

"Q Did anybody tell you what kind of  
tissue it was, whether it was cancerous or not?

"A I don't remember that."

MR. HASTINGS: On my cross examination I would like to read part of my recross here.

THE COURT: Go ahead.

MR. HASTINGS: Actually, it comes in after his questioning. May I read it after his questioning?

MR. BRADFORD: It is stipulated this comes after a series of questions I am about to read.

It makes no difference to me.

THE COURT: Read yours now and then he will follow.

MR. BRADFORD: (Reading)

Q Doctor, Mr. Hastings read you a part of a sentence in your conclusions: 'Subsequent course as judged by X-ray findings became more characteristic of malignancy,' where he stopped. 'though inflammatory origin cannot be ruled out in the absence of surgical exploration and an autopsy.' Is that the complete sentence?

A That is the complete sentence, yes, sir.

Q And the following sentence: 'The original disease in the apex of the

left lung is of inflammatory origin and not malignant in the opinion of this examiner.'

A That is correct.

Q Now, referring to the three particular films which he covered, January 17, 1956, January 19, 1956, were there any findings of any bone involvement?

A No, sir. There was a question on one by someone else, and I think it probably was the one he showed me before and I disagreed with it on examination, because I think it is due entirely to overlapping shadows in the lung and not in the bone.

Q Doctor, referring to the medical record which is already in evidence from Mercy Hospital, I call your attention to the very next examination dated June 19, 1956, or about one month later, in which the doctor says 'I believe there is definite rejuvination of the second rib on the left side.'

"I ask you whether in your

experience you can have erosion of the bone and rejuvenation of it the next?

"A You can under some circumstances, but I don't believe there is anything, any evidence of anything I saw that there was definite erosion, so it would be rather simple for it to appear to have been regenerated.

MR. BRADFORD: That is all.

MR. HASTINGS: (Reading)

"Q You can have rejuvenation within a month; is that right?

"A Not complete, no.

"Q You can have some rejuvenation?

"A Yes, but not complete in a month.

"Q Doctor, calling your attention to the Jackson Memorial Hospital records, a biopsy done on a lymph node with a pre-operative diagnosis of possible carcinoma of the left lung, would you tell us what, in lay terms, a diagnosis---

"THE WITNESS: I don't feel I am qualified to say anything about a biopsy report. I am not a pathologist.

"Q Can you tell us what a squamous



cell carcinoma is?

"A Yes.

"Q And that is what the biopsy shows it to be?

"A Where was it from?

"Q Jackson Memorial Hospital.

"A I mean on the patient... On the cervical node on the right.

"Q Is a squamous cell carcinoma a cancer?

"A Yes, sir."

MR. HASTINGS: That is all.

MR. BRADFORD: I would like to read the report--- This is just a reading of X-rays and what he saw in the pictures.

MR. HASTINGS: The thing, as I recall, and we will have to look at the record on this, but there are two parts, the thing we questioned him on and he questioned him on were put in, and that is all, not twelve pages of review or fifteen pages, as it were, because none of these pages were even discussed.

This is his entire report as submitted to the other side, which is probably fifteen or twenty pages long. Not all of that was put in.

The particular pages that we questioned him-- that you questioned him about and I questioned him about, all right. If he is going to read into evidence, as it were, other X-rays that I did not cross examine him on and had no opportunity to cross examine him on, I still do not have an opportunity to cross examine him on it.

MR. BRADFORD: We do not go as far as we went before. We go as far as the number of X-rays we questioned him on before.

(Discussion off the record.)

(The report of Frazier J. Payton, M.D., was read to the jury as follows:)

"March 11, 1945. MEDICAL DEPARTMENT -  
U.S. NAVY. PA CHEST:

"The bony thorax and diaphragm are normal. There is slight dextroconvex scoliosis mid and upper dorsal. The cardiac silhouette is normal. There is no evidence of significant acute or chronic pulmonary changes in either lung field. The apices, particularly, are clear.

"April 22, 1946. VETERANS HOSPITAL,  
PA Chest Film:

"No discernible changes in the left apex

or elsewhere are noted in either lung field (overlapping of rib shadows in both apices).

May 3, 1949. VETERANS HOSPITAL,  
Chest:

"A somewhat deteriorated film of the chest shows very faint haziness in the left upper lobe overlapping the shadows of the first and second ribs and the adjacent medial aspect of the clavicle. There is no definition but a suggestion of increase in the density at this site and a small area of soft tissue changes immediately below the clavicle.

"May 3, 1949. VETERANS HOSPITAL  
(Re-examination):

"Mottled cloudiness in the apex of the left lung, as previously described on 5/3/49. The changes are radiographically characteristic of chronic inflammatory manifestations.

"September 12, 1951. VETERANS HOSPITAL.  
Chest:

~~"Slight mottling of the left apex is~~

evident, but the apices are largely obscured by overlapping rib shadows. The remainder of the lung fields are clear.

"July 1, 1953. VICTORIA HOSPITAL -  
Out-Patient Department. PA Chest Film:

There is a fracture of the right 7th rib posterior with slight overlapping and some evidence suggestive of an early healing process. The bony cage is otherwise normal.

"The heart is small and centrally placed. Hilum vascular markings are normal to moderately accentuated, particularly the left. The right lung field is normal. The left shows minimal fibrosis from the extreme apex towards the hilum and paramediastinal. The extreme apex also shows small fibroid changes with vacuolization, due to inflammatory disease. The remainder of the left lung field is clear.

"January 17, 1956 and January 19, 1956.  
VETERANS HOSPITAL, Chest:

"A lordotic chest film and right and left anterior oblique films of the chest

show an ill-defined opacity in the extreme left apex with radiating fibroid manifestations toward the left hilum shadow. There are similar fibroid changes in the lateral aspect of the left apex. Narrowed interspaces left upper, suggesting poor expansion.

"The findings are suggestive of either an inflammatory process of slow progression, or possibly early neo-plastic change. The remainder of both lung fields are clear. (The left hilar markings are slightly elevated.)

"March 30, 1956. MERCY HOSPITAL films, Chest PA, lateral and lordotic:

"Chest examination of this date again show radiolucencies apparently somewhat increased in number and amount in the opacity extreme left apex previously described. the opacity seems to have diminished somewhat presumably from some form of therapy. The radiolucencies suggest degenerating tissue. The lung fields are otherwise unchanged.

"May 16, 1956. MERCY HOSPITAL, Single Bucky Supine Film of Chest:

"A single film again shows the nodule in the left apex, paramediastinal with radiolucencies as previously noted, possibly slightly changed in character. The nodule appears to be definitely, though moderately, smaller. No bone changes are observed.

"June 19, 1956. MERCY HOSPITAL, PA,  
Left Lateral and Lordotic Films of the Chest:

"A single lordotic film of the upper portion of the left hemithorax, and PA and left lateral films, show loss of outline and configuration of the tumor in the left apex previously noted. It has changed considerably in substance. There is no bone erosion of adjacent ribs nor elsewhere in the included area.

"August 13, 1956. MERCY HOSPITAL, PA  
Lateral and Lordotic Chest. Spot films of left shoulder and left lung apex:

"There has been further aggression of the tumor left apex. It is no longer showing nodularity in character. It is quite ill-defined and fibroid. There has been no change, however, in rib interspaces on the left

throughout this series. No evidence of bone changes. There is soft tissue calcification adjacent to the greater trochanter of the left humerus."

And the summary--

MR. HASTINGS: Just a moment. We object.

MR. TOOTHMAN: I understood when we started we were going to pick out what we wanted to read.

THE COURT: You can read his report, but his conclusions are not a part of the report as such. You have already read his conclusions in the other testimony. Don't do it again.

MR. TOOTHMAN: It was done piecemeal.

THE COURT: Well, piecemeal is sufficient.

MR. BRADFORD: Your Honor, we have portions of the hospital records. They are quite voluminous and we have taken out certain pages of them that we would like to offer.

Counsel did not put them in on their side of the case. I can exhibit these pages to him, and I would like to put in evidence some of them. If he would like to look at the copies of ours, I could put in the entire hospital record.

MR. HASTINGS: I wonder if I could do this

during the recess, because the record is voluminous. I wouldn't want to make a hasty decision on this. Could we hold that until a later time in the case?

THE COURT: Suppose we do recess now and then meet at 2:00 o'clock. Be back at 2:00 o'clock.

We will recess so they will have a chance to prepare these records and boil them down to a smaller content.

You attend to them over the period of the recess.

(Whereupon, recess taken at 12:30  
o'clock P.M., to reconvene at 2:00  
o'clock P.M. the same day.)

- - -



Federal Courthouse,  
Miami, Florida,  
Monday, 2:30 p.m.  
November 23, 1964.

AFTERNOON SESSION

Thereupon--

(The jury entered the courtroom,  
and the following proceedings  
were had:)

THE COURT: Proceed.

Thereupon--

JAMES M. MORASKI,

was called as a witness on behalf of defendant and, having  
been first duly sworn, was examined and testified as follows:

THE CLERK: State your name, address and your  
occupation.

THE WITNESS: My full name is James M. Moraski.  
I am from [DELETED] . I reside at [DELETED]

. I am presently a statistician for the Cancer Control  
Program under the Bureau of Vital Statistics, Florida State  
Board of Health.

DIRECT EXAMINATION

BY MR. BRADFORD:

Q. Mr. Moraski, do you have anything to do with keeping records as to the cancer incidence or the death of people reported to have died from cancer in the State of Florida?

A. Yes, I do.

Q. Did you at our request check the records for 1963 and check the death rate--that is, the total primary lung cancer death rate per 100,000 in the State of Florida for 1963?

A. Yes, sir, I did.

Q. Would you tell us what the total death rate shows from primary lung cancer in the year 1963 for 100,000 in this State?

A. In the State of Florida in 1963, a total of 809 persons died of lung cancer, yielding a rate of 33.4 deaths per 100,000 population.

Q. Can you break that down for us in percentage or the number of males per 100,000?

A. Yes, I can.

Q. Can you give us that answer?

A. The number of males amounted to 5.5 deaths

per 100,000.

Q. How about females? Did you break that down?

A. Yes, sir. 9.3.

Q. How about white males? Did you break that down?

A. I did.

Q. Can you give us that figure?

A. White males amounted to 64.1 death per 100,000 population.

Q. How about white females?

A. 10.1.

Q. How about nonwhite males? Did you break that down?

A. Yes, sir, I did. 31.9.

Q. And nonwhite females, did you break that down?

A. 5.4.

Q. Now, let's go through the number of people, the total primary lung cancer deaths in Florida for 1963. Let us know how you broke those down or how you have them classified in the statistics, whether they are bronchus or pleura or however.

A. The primary site of cancer of the lung is classified under Code 162. It contains cancer of the

trachea, of the pleura and of the bronchi and the lungs, specified as primary.

Q. How many were there of that in that classification?

A. There were 809.

Q. How many males?

A. 709.

Q. That is the whole State of Florida?

A. Correct.

Q. How about female?

A. 100.

Q. Did you break that down into white males?

A. Yes, I can. White males amounted to 631.

Q. And white females?

A. White females, 93.

Q. Nonwhite?

A. Nonwhite males, 78.

Q. Nonwhite females?

A. Nonwhite females, 7.

Q. Can you break it down for us by counties?

I will ask you to check for Alachua County.

A. Yes.

Q. Primary cancer and whether or not it is

unspecified or primary. Tell us how that is broken down by counties in Florida.

A. The only breakdown for lung cancer by county is Code 162 and 163.

Q. What does that mean?

A. 162 is primary, specified as primary lung cancer. 163 is cancer of the lung not specified as primary or secondary.

If a doctor were to say on a death certificate cancer of the lung, he wouldn't specify primary. He would just state cancer of the lung. We would give that a 163.

Q. Now, would you give us Alachua County for 1963?

A. In 1963, Alachua County, obtained a rate of 27.0 per 100,000.

Q. Duval County?

A. 20.3.

Q. Hillsboro County?

A. 33.0.

Q. Orange County?

A. 19.5.

Q. Palm Beach County?

A. 35.0.

Q. Dade County?

A. 31.9.

MR. BRADFORD: You may inquire.

CROSS EXAMINATION

BY MR. HASTINGS:

Q. The papers from which you prepared your records, or the data, are from the death certificates; is that correct?

A. Yes.

Q. And the death certificates are those instruments which are filled out by the doctor who pronounced the person dead or at least knows the person is dead.

A. He is not always a doctor, but for the most part it is a doctor.

Q. And then that doctor, assuming in most cases it is a doctor, will put down what was the cause of death. He will put down carcinoma of the lung or cancer of the lung; is that right?

A. Well, it's not a single code, because we code it to underlying causes.

For example, a man might be in an automobile accident or he's involved in one. But he catches pneumonia while he is in the hospital. Now, the underlying cause is the automobile accident. He died of pneumonia, but we code it to the automobile accident.

Q. I am talking about cancer of the lung. In that instances you would have down there, generally, cancer of the lung or carcinoma of the lung, something to that effect, and that is what you would be interpreting?

A. I'm not a nosologist. I wouldn't know.

Q. The doctor sometimes puts down cancer of the lung or carcinoma of the lung, and then he will put down primary and at other times he will put down secondary?

A. If he doesn't put either, we code to 163, unspecified as primary.

Q. If the doctor specifically puts down primary, then you code it with one number and that number is 162?

A. That's right.

Q. Now, isn't it a fact that many doctors don't bother putting down primary or secondary?

A. I'm very unqualified to say.

Q. Do you find many death certificates that don't have the primary or secondary after it?

A. Then it's Code 163. There are a lot of 163s.

Q. And those 163s may contain a great number of primary; isn't that correct, as far as you know?

A. I can't say; I don't know.

Q. Let us assume a cancer originates in the liver

and it spreads somewhere else--to the brain or to the lung, do you know how that is coded? Is that called cancer of the liver with secondary spread to the lung?

A. If it is stated as primary of the liver--

MR. BRADFORD: Your Honor, I called this witness only to testify to what the record shows. He is not in a position himself to classify it. He has only been brought here to testify from records, what the records and figures show; so his knowledge of how the classification is made by doctors or what they do, he couldn't testify to that.

THE COURT: He may know or he may not know.

BY MR. HASTINGS:

Q. If a cancer begins in the liver and spreads up to the lung, that is, a cancer of the liver which spreads to the lung with metastasis, is that cancer of the liver secondary to the lung?

THE COURT: He said he doesn't know.

BY MR. HASTINGS:

Q. Is that an accurate statement or not?

A. I guess anybody could interpret it that way.

Q. When you use the term primary, by primary you mean where it originates, don't you?

A. That's correct.

Q. Is that your understanding of it?



A. Correct.

Q. But if it was starting here in the lung--

A. But as I said, if it stated it as a primary site, we code it to the primary site.

Q. All right.

A. And if it says the liver, primary, we give it liver, primary.

Q. And if something spreads to some other organ--

A. We code to the primary classification. We state the primary site with metastasis to somewhere else. We still code to the primary site.

Q. Your Code 163 may contain many primaries; is that right, based on your own knowledge?

A. I don't know. I'm not qualified to state. If I were to go down and go through all our death certificates, approximately 50,000 death certificates a year for ten years, I could make a--

Q. Can you tell us, on your Code 163, how many deaths there are recorded for the year that we are speaking about?

A. Yes.

Q. Would you please, from your records?

A. In 1963 there were 960 deaths attributed to Code 163.

Q. Code 163 is carcinoma of the lung unspecified?

A. That is primary or secondary.

Q. As to whether it's primary or secondary, so it might be either primary or secondary; is that right?

A. Yes.

Q. You are not sure of the classification?

A. It is unspecified as to primary or secondary.

Q. By unspecified as to being primary or secondary, do you mean it is not stated whether it is primary or whether it is secondary? Is that what you mean by that?

A. Yes.

Q. Would you go ahead with the rest of the thing?

A. What else do you want?

Q. Is that the only year you read--1963?

A. Yes.

Q. In other words, that amount is liable to double from what you gave before, isn't it?

A. The total amount--I don't know.

Q. What did you just read me from 163?

A. 960.

Q. And the first figure was 8 or 9?

A. Yes.

Q. So the two of them are about the same amount,

isn't it, or a little bit even larger than the first one?

A. Yes.

Q. And similarly for the various counties that you read into evidence, can you tell us what this other classification of lung cancer showed for those counties that you read from Code 162?

A. As I stated in our breakdown by our causes for county, we do not go into a breakdown. It's just the 163 or 162. We accumulate on our machine 162 and 163.

Q. Do you know what the spread is? Do you know what the average age is of the lung cancer people in Dade County or Alachua County?

A. No, I don't.

Q. Do you know what per cent are in the lung cancer age--that is, fifty to sixty-nine?

A. No.

MR. HASTINGS: I think that's all.

MR. BRADFORD: No further questions.

(Witness excused)

(Whereupon, the prior testimony of  
Dr. Thomas Marron was read to the  
jury as follows:)

MR. BRADFORD: (Reading)

"THE COURT: State your name and address  
and your profession, and briefly your quali-  
fications.

"THE WITNESS: My name is Dr. Thomas  
Marron, [DELETED] I am  
Professor of Pharmacology and Therapeutics,  
and Chairman of that Department at the  
University of Florida, College of Medicine  
in Gainesville.

"I was educated at Princeton University  
where I took a Bachelor degree in Chemistry  
and for four years after that, I was an  
industrial chemist where I did considerable  
work on compounds containing sulfa, hydrogen  
and heavy metals.

"During the war, I worked under the  
Office of Naval Research on problems that  
involve pharmacology of arsenic and ended  
with discovery of a drug which is used in  
the treatment of tropical diseases.

"At the end of the war, I went to Johns Hopkins Medical School and was instructor in pharmacology at that school and received my M.D. degree in 1951.

"From there I went on as an industrial pharmacologist at the American Cyanide Company where I worked four years, and during that time developed two drugs which are now in clinical use. Technically, they have no relevance to the present case.

"In 1955, I came to Florida to organize the Department of Pharmacology at the school there.

"THE COURT: Are you licensed to practice in the State of Florida?

"THE WITNESS: Yes.

"THE COURT: Tell us briefly what societies and medical associations you belong to, Doctor.

"THE WITNESS: I belong to the New York Academy of Sciences; the American Society for Pharmacology and Experimental Therapeutics; the Society for Experimental Biology and Medicine; the Southern Society for Clinical

Research, of which I am vice-president.

"Q Have you authored or co-authored articles in connection with medical and scientific journals?

"A Yes.

"Q Do any of those relate to cancer?

"A No.

"Q Are you the editor of the Journal of Pharmacology and Experimental Therapeutics?

"A I am one of the editors.

"Q What is your specialty, chemical or biochemical?

"A My specialty is-- In connection with the last statement, I have authored about eight or so papers on the subject of arsenic pharmacology for awhile, and still do regard that as my specialty.

"I am interested in the fate of drugs in the body and absorption distribution, excretion and the biochemical aspects of pharmacology.

"I have done considerable work in the field of kidney functions, the excretion of physiological substances in them and secretion

of foreign substances via the kidney.

"Q You are not a clinician, statistician, epidemiologist or pathologist, are you?

"A No.

"Q Have you had an opportunity to review the medical records of Edwin Green in this case?"

MR. HASTINGS: Objection. I do not think it is material. All right. Go ahead.

MR. BRADFORD: (Reading)

"A Yes, sir.

"Q Can you tell us how you became interested in the subject of arsenic in connection with your professional duties in the area in which you were interested.

"A Yes. It occurred when during the war I was working on the synthesis of some organic compounds containing the sulfonamide group. I became very much interested in the reactivity of elements such as arsenic and antimony with the sulfonamide group.

"I began synthesizing compounds

in this field of arsenic and antimony chemistry and I came to Johns Hopkins in 1943 to go to work in the Department of Colontology and to continue under the Office of Naval Research to develop a drug for this disease, pharisis, which at that time was incurable and regarded as a major problem in World War II in connection with troops in the Pacific.

"I became very much interested and involved in the old question of arsenic chemistry and pharmacology at that time and worked rather intensively on this for four or five years thereafter.

"Q In the course of your work, have you made any number of arsenic determinations, developed and published any revelation of the micro-determination of arsenic?

A Yes. I have made with my own hands and under my supervision thousands of determinations for the detection of arsenic in tissue and had occasion to work and modify and I think improve microchemical methods for the determination of this.



"Q This has been published in 1945, I believe, in the Journal called Analytical Chemistry.

"In connection with the substance, what work have you done in connection with elephantiasis? Was that one of them?

"A Elephantiasis is the end result of the disease called phariasis.

"Q You were the one that worked up the intravenous injection for that?

"A Yes, I and my colleague. He and I introduced this.

"Q Can you tell us what the arsenic is in the main stream smoke of Lucky Strike cigarettes?

"A Yes. It is lead arsenic.

"Do you want me to draw the formula on the board?

"Q If you think it will be helpful, go ahead.

"THE COURT: I am afraid we will not understand but it might be helpful.

"THE WITNESS: It is very simple. This is the symbol for lead. This is the symbol

for arsenic. This is the symbol for oxygen.

"This is the symbol for hydrogen. It is lead-acid arsenic and the arsenic in this form is in pentavalent form; so, it is customary to put this Roman symbol 'V' above this, and explaining just exactly what type of arsenic this is, because it is extremely important in all this and any other type of work a pharmacologist engages in."

MR. HASTINGS: We would like to show an objection and move to strike that answer insofar as he is talking about the particular type of arsenic in Lucky Strike cigarettes in which we will show later he has no knowledge.

THE COURT: I will sustain the objection at this time.

MR. HASTINGS: Your Honor, the next question has to do with the dosage used in elephantiasis. He talked about the amount he uses intravenously which he feels is not particularly relevant.

He talks of some inhalation type arsenic when he gets into the Lucky Strike cigarettes. We think that is entirely remote.

THE COURT: Does he agree there is a difference?

MR. BRADFORD: No, sir, he does not in here.

MR. HASTINGS: He says there is a difference in the dosage.

MR. BRADFORD: In the dosage, yes. He is within the range of what we are talking about.

He can tell the amount he gives intravenously.

THE COURT: I will let him tell that for whatever it is worth. I do not think it is worth very much.

MR. BRADFORD: (Reading)

"Q In connection with this intravenous injection you were responsible for which was for elephantiasis, can you tell us what dosage was given in that injection?

"A Yes. The dose, as is customary, is adjusted to body weight, and it is approximately one milligram per kilogram. A human being weighs about 60 kilograms; so the dosage of the drug would be about 60 milligrams, and since we have been talking of milligrams we'll say it is 60,000 micrograms.

"THE COURT: If he took a certain amount of arsenic and it accumulated in your body, it probably might have some similar effects where it may accumulate; is that right?

"THE WITNESS: Each time we inject a patient with this drug, and this is characteristic of many arsenic drugs, 12,000 micrograms would be immediately deposited in his blood stream.

"Q Now, Doctor, will you explain to us what relationship there is, if any, between arsenic given intravenously, as contrasted with arsenic inhaled in the smoking of cigarettes?

"A When arsenic is inhaled, it is certain that it reaches the general circulation rapidly and is handled in the same way that a drug is handled given by almost any parental route. 'Parental' is the term used to distinguish from oral. It means systemic administration; so I think that in considering the over-all pharmacology of arsenic, there is a connection, and there is some relevancy in the intravenous to the--taking it through the inhalation route.

"I don't want to say there is an exact relationship, but I do think that it is an aspect of the pharmacology of the drug

that is very significant since in both cases we are concerned with the general effect of arsenic on body cells, and we know that when a substance reaches the lung it immediately reaches the blood stream.

"We know when a substance is put in the blood stream it immediately reaches the lung. There is only one layer of cells between the alveolar wall and the blood stream.

"Q Now, you put on the board that this was a pintavalent rather than a tri-valent I believe.

"Is there any significance to that?

"A Yes---"

MR. HASTINGS: Your Honor, we object to that. The pintavalent is what the deposition shows what he got from this other professor's literature.

THE COURT: If he did, omit it.

MR. HASTINGS: So, we have to object to that question and the answer that follows it. It is not his work he is talking about.

MR. BRAIDFORD: I do not read it that way myself.

THE COURT: What page is it?

MR. BRADFORD: Page 867, the last paragraph, the last question on that page and the beginning of the answer.

MR. HASTINGS: The question is this---

MR. TOOTHMAN: I will show it to the Judge.

MR. HASTINGS: The Court has just struck pintavelent based on the fact it was hearsay.

THE COURT: I do not think he can go into this particular cigarette. He can testify to the two types. He may do that.

MR. BRADFORD: We can read down to line 14 and leave the rest out.

THE COURT: He cannot say what is contained in cigarettes.

MR. HASTINGS: The question specifically refers to that--something he put on the board.

THE COURT: I know. Our doctor here was not skilled enough to put it on the board.

MR. HASTINGS: Is our objection ruled on?

THE COURT: The objection is overruled, except as to the last paragraph which deals with the subject matter of this suit.

MR. BRADFORD: (Reading)

"A Yes. I should say that the drug

that we developed during the war was a trivalent compound; and one of the more toxic of the type of that figure of 12,000 micrograms that we are injecting represents a comparative toxic exposure of a patient. That should be recognized.

"So, with that preface, I should like to say if this had been a pentavalent compound we would have been able to give him measurably more, that being far more less toxic.

"If this drug had been a pentavalent compound, we would have had to give to secure any effect at all between ten and a hundred times this dose; and that is the case because there are pentavalent compounds in it which is used for the treatment of African sleeping sickness, which is given in enormous doses, one gram a day, one million micrograms. You see, it's a hundred times what I spoke of.

"Q Doctor, is arsenic, whether taken intravenously or inhaled, retained by the body? Is there an accumulative effect?

"A Only in very small amounts, and only in very specific cases, the chief being the hair, and the hair follicles and the nails, the substances of the body that have a large content of protein called keratin, which acts as a trap for arsenic.

"This retention, though, compared to these large amounts that we are talking about, are really very small, indeed.

"For instance, if we would inject 12,000 micrograms in this example, we would find not more than one or two micrograms per gram of tissue, or perhaps five micrograms.

"A very small percentage of this is in the hair, but, for the most part, virtually all the arsenic is excreted by the kidney on a daily basis.

"You give the drug; it is excreted. You give the next dose; it is excreted.

"Q Has there, in your experience, been any inhaling of arsenicals that have shown any retention in the body of the arsenic?

"A No. Experiments on humans have been carried out in which this substance was administered



to humans, both in the form of industrial spray, and, of course, working in apple orchards, and also given orally, and it showed without any doubt that this substance turns over almost quantitatively in the body; that what you put in comes out.

"In the case of two human volunteers who took this substance, we know exactly what was given, and we knew exactly what was collected in the urine, and they matched within an experimental area. So I feel a retention of this substance in the body is trivial.

"Q With respect to the type of arsenic in the amounts that we have shown here---"

MR. BRAINFORD: That comes out.

(Reading)

Q Did you have something to do or are you acquainted with the mapharsen drug?

"A Yes. It was a very important drug. Mapharsen was a drug used in the treatment of syphilis in the United States and all over the world for about fifteen years."

MR. HASTINGS: Your Honor, at this point we raise an objection. We are going far afield.

This particular drug he is talking about is an organic type arsenical. That is not what we are concerned with in Lucky Strike cigarettes.

I believe the Court then asked the doctor and the doctor answered the question---

MR. BRADFORD: (Reading)

"THE WITNESS: It is not the same substance, but again it is relevant to show that arsenic has as a certain pharmacological property, in the case-- I do think that the fact that mapharsen has been given to probably hundreds of thousands of people in doses a thousand times greater than the less toxic form of arsenic---"

MR. BRADFORD: We had better leave that out.

"---(continuing) and there has been no suggestion of any of the type of lesion that we have been considering here.

"I believe that any medical man or pharmacologist would take this as a very significant reason, as a very significant

piece of evidence about the pharmacology of arsenic.

"Arsenic is nothing mysterious. Thousands and thousands and thousands of people--millions, perhaps--have received it, and the form that they have received it in the United States in the 1930's and 1940's has been in the form of mapharsen; so that this is the drug that we know perhaps the greatest about. I myself have done some work with it."

MR. BRADFORD: We will omit the rest of the page and go to the answer on top of page 873:

"A May I say one more thing? Because we know that arsenic taken in by the lung has the same alternate fate as it does when taken in by this route.

"Q Would it be possible to have any evidence of arsenic in the lung without a manifestation of it in any other place in the body?

"A That would be extremely unlikely. The skin manifestations of arsenic in chronic arsenic poisoning appears so promptly and so

regularly that I would say that this would be the first thing one would see and perhaps the second would be from neurological manifestations.

"Since the lung is generally not incriminated in chronic arsenic poisoning, I would say that almost inevitably these other sites would appear first, the skin and the nervous system.

"Q In your examination of the medical records of Mr. Green, did you see any such other manifestations?"

MR. HASTINGS: Your Honor, we object on the basis of immateriality and irrelevancy.

THE COURT: I will sustain the objection. He did not examine Mr. Green.

MR. BRADFORD: (Reading)

"Q Doctor, is arsenic in the pentavalent form known to cause cancer to the lung or any other site?

"A I have never seen any indication that pentavalent arsenic causes cancer of any tissue in the body, including the skin.

"Q Would your opinion be the same with respect to the co-carcinogen effect?

"A Yes.

"Q Is there any change after it gets into the body?

"A That has not been thoroughly studied. Quantitative data on that point is lacking."

THE COURT: Because certain matters have been dealt with in the previous case, as you now understand, and because certain features have been eliminated and because certain of these witnesses cannot be present for the purpose of cross examination, we are limiting their testimony for technical reasons that need not concern you at the moment, but there are substantial reasons for so limiting their questions and answers because of circumstances.

MR BRADFORD: Page 877, reading the first paragraph, line 4:

"So that the margin between this 80 micrograms and the pentavalent form and the three or four hundred milligrams in the trivalent form is perfectly enormous, probably in magnitude of ten or 100,000."

MR. HASTINGS: (Reading)

"Q. Doctor, the best known books in the medical field of pharmacology are those two that I think you heard us discussing before-- Goodman & Gilman and Sollman.

"A. No.

"Q. What did you study, Doctor? I correct the question. What did you study from, Doctor?"

Page 878, Line 5:

"THE WITNESS: I used Goodman & Gilman as the source. I actually didn't use a textbook, and my students now don't use one textbook as a source of primary knowledge. That's why I wanted the question to be different, because I have been teaching this for four years, and this is a very difficult question.

"I don't assign a textbook in my course. I tell the students what textbooks exist, and I have described and criticized each one, to the best of my knowledge, and then they have the job of picking and choosing their way through the textbooks.

"If you want, I can tell you what I tell them about each of these textbooks.

"Q. I would rather you answer my question, if you could. I asked you whether or not these are the best known medical textbooks used.

"A. I answered the question and I said no.

"Q. They are not the best known?

"A. No.

"Q. What was used at Johns-Hopkins?

"A. What was used at Johns-Hopkins at what time?

"Q. Well, from 1945 to 1948.

"A. Do you want to know what was used at Johns-Hopkins in 1948?

"Q. Yes.

"A. In 1948 Goodman & Gilman was used.

"Q. And you have referred to that yourself

from time to time. Have you ever seen it?

"A. Yes.

"Q. And the other book is Sallman. Is it also used standardly in medical schools?

"A. Sallman? No.

"Q. It is not?

"A. No.

"Q. You said, too, Doctor, that you were familiar with the existing body of medical literature. Were you referring to the existing body of medical literature in drawing some of your conclusions? Have you written any medical textbooks?

"A. Medical textbooks?

"Q. You are testifying here for the tobacco company as an expert in pharmacology.

"A. I have not written any textbooks."

MR. TOOTHMAN: I think that next question will have to come out. It refers to--

MR. HASTINGS: That's the reason for my objection. So the record is clear, my objection was based on the question of how many examinations.

MR. BRADFORD: The next answer is the very



thing he was objecting to.

MR. HASTINGS: It's the basis of the objection, sir.

This has to be in the record to show my objection.

THE COURT: He has already answered it.

MR. HASTINGS: No. That is the first time I asked the question. I'm basing my objection on this answer.

THE COURT: All right, we'll let it in.

MR. HASTINGS (Reading):

"Q. How many examinations have you made of the arsenic content of their cigarettes, Lucky Strike cigarettes?

"A. None."

Page 881:

"Q. Speaking of the open literature, as you put it, Doctor, as a matter of fact, the so-called carcinogens in tobacco smoke, arsenic, has been in the medical literature incriminated as a possible carcinogen in tobacco smoke. You will agree with me on that, won't you?"

MR. BRADFORD: Just one minute. I object to

that, Your Honor. He's going into the medical literature and he's not going into a specific thing that the doctor has relied upon or said that he has relied upon. The doctor has been testifying up to this point from his own knowledge and he wasn't getting it from any other place.

Now counsel seeks to examine him on cross-examination on something that somebody else did.

MR. HASTINGS: I will withdraw that, your Honor, but this is a question that was admitted the last time.

THE COURT: All right, go ahead.

MR. HASTINGS (Reading):

"Q. Are you familiar with the publication of Kenoway who was with the United States Public Health Department?

"A. Kenoway wasn't with the United States Public Health Department. He was a British bio-chemist.

"Q. Did he list arsenic--"

MR. TOOTHMAN: I will object to that.

MR. BRADFORD: Here we go again.

THE COURT: I think you are going into other matters.

MR. HASTINGS: I have him on cross-examination. I think I have a right to determine his qualifications.

THE COURT: What Kenway said or did doesn't establish this to be right or wrong.

MR. HASTINGS: Line 6, Page 885:

"Q. Doctor, again, as I understand your testimony, you also disagree with what we were discussing there about the prolonged use of arsenic causes an abnormal proliferation of epithelium, or do you agree with that?"

MR. TOOTHMAN: Just a minute. Let me object again as counsel.

He is referring here, your Honor, to testimony which was taken in front of this doctor--Dr. Flipse--and he is referring to this testimony which he hasn't heard now.

THE COURT: Well, this doctor testified that the prolonged use of arsenic did not cause a lesion, I believe he said.

MR. HASTINGS: That's right.

THE COURT: What relation has that to that testimony, if any?

MR. HASTINGS: My question is: "Do you also disagree with that--" what we were discussing there. "You

also disagree with what we were discussing there about the prolonged use of arsenic causes an abnormal proliferation of epithelium, or do you agree with that?"

It is whether or not he agrees that arsenic causes an abnormal proliferation of epithelium.

And the answer was:

"A. It has to be exactly specified what type of arsenic is being administered, how long the administration is, and what the dosage is. I can cite experiments suggesting places where arsenic does cause this type of proliferation, and I can cite experiments that show that it does not, and you will find that the difference has to do with the dose and the type of compound used; so a general statement of that type has no relevance unless the specific perimeters are given it is both right and wrong."

"Q. Doctor, do you agree that long continued exposure to arsenicals may produce cancer?"

"A. I would not agree with any statement that has the general term arsenicals in it because I have tried to make clear that every arsenical

compound is different from every one, and if we have time and if I could muster up the interest in the court, which I am sure that I cannot, I could write dozens of compounds of arsenic and tell the different products of every single one with respect to their absorption, distribution, excretion, toxicity and medical use.

"Therefore, the term arsenical is almost devoid of meaning. You might as well say, 'drug'".

Page 888, Line 9:

"Q. Doctor, with respect to what we are talking about, an agent that has an effect on the enzymatic system of a cell, it is frequently in a very small dose; is that not correct?

"A. The word 'small' has no meaning.

"Q. To whom, Doctor?

"A. Pardon?

"Q. You mean to you or to me?

"A. It should have no meaning to either of us because there's no standard.

"Q. Well, what is a catalyst, Doctor?

"A. A catalyst is an enzyme. A catalyst

is a biological enzyme.

"Q. And what effect does it have upon a chemical reaction?

"A. Would you strike that, please? A catalyst is-- Would you strike that because I had it backward.

"An enzyme is a biological catalyst. A catalyst is something that speeds the rate of achieving equilibrium in a reaction. It speeds a reaction, and an enzyme is a catalyst in the body."

MR. BRADFORD: One further question.

Page 887:

"Q. Doctor, have you done any work along that line?"

We will have to start with the answer, I guess, starting with the answer at page 887, Line 19:

"A. Well, I have a pretty good general knowledge of whether there's carcinogen or not."

Let's start with the witness on Line 12: That will make more sense, I guess, on the same page. The question starts at Line 19, Page 886:

"Q. Doctor, I believe you said the arsenicals or rather that this particular one that you were describing there--let me put it another way. I believe you heard when we were questioning Dr. Flipse and you were seated back there and we were discussing from the Goodman & Gilman book about the idea that it is stored in the lung, and I think you testified that it was in the hair. . ."

"THE WITNESS: I tried to say that these were the keratin containing organs, and that hair follicles and hair and nails have a large amount of keratin. To my knowledge, the same situation does not exist in the pulmonary epithelium.

"Q. Doctor, have you done any work along that line? Any experimental work?

"A. Well, I have a pretty good general knowledge of whether there's carcinogen or not.

"Q. Have you personally examined any pulmonary epitheliums?

"A. No."

THE COURT: Do you have anything further?

MR. HASTINGS: No, sir, we have no further cross.

THE COURT: All right.

We will meet again tomorrow morning at 9:30 a.m.

(Whereupon, the trial in the above-styled cases adjourned at 4 o'clock p.m., to reconvene Tuesday, November 24, 1964, at 9:30 o'clock a.m.)

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**CENTRAL FILES**